# Thecus N299

User's Manual

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# About This Manual

All information in this manual has been carefully verified to ensure its correctness. In case of an error, please provide us with your feedback. Thecus Technology Corporation reserves the right to modify the contents of this manual without notice.

Product name: Thecus N299
Manual Version: 1.1
Release Date: November 2007

# Limited Warranty

Thecus Technology Corporation guarantees all components of Thecus N299 are thoroughly tested before they leave the factory and should function normally under general usage. In case of any system malfunctions, Thecus Technology Corporation and its local representatives and dealers are responsible for repair without cost to the customer if the product fails within the warranty period and under normal usage. Thecus Technology Corporation is not responsible for any damage or loss of data deemed to be caused by its products. It is highly recommended that users conduct necessary back-up practices.

# Safety Warnings

For your safety, please read and follow the following safety warnings:

- Read this manual thoroughly before attempting to set up your N299.
- Your N299 is a complicated electronic device. DO NOT attempt to repair it under any circumstances. In the case of malfunction, turn off the power immediately and have it repaired at a qualified service center. Contact your vendor for details.
- DO NOT allow anything to rest on the power cord and DO NOT place the power cord in an area where it can be stepped on. Carefully place connecting cables to avoid stepping or tripping on them.
- Your N299 can operate normally under temperatures between 5°C and 40°C, with relative humidity of 0% – 80%. Using the N299 under extreme environmental conditions could damage the unit.
- Ensure that the N299 is provided with the correct supply voltage (AC 100V ~ 240V, 50/60 Hz). Plugging the N299 to an incorrect power source could damage the unit.
- Do NOT expose the N299 to dampness, dust, or corrosive liquids.
- Do NOT place the N299 on any uneven surfaces.
- DO NOT place the N299 in direct sunlight or expose it to other heat sources.
- DO NOT use chemicals or aerosols to clean the N299. Unplug the power cord and all connected cables before cleaning.
- DO NOT place any objects on the N299 or obstruct its ventilation slots to avoid overheating the unit.
- Keep packaging out of the reach of children.
- If disposing of the device, please follow your local regulations for the safe disposal of electronic products to protect the environment.

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# Chapter 1: Introduction

## *Overview*

Thank you for choosing the Thecus N299 IP Storage Server. The Thecus N299 is an easy-to-use storage server that allows a dedicated approach to storing and distributing data on a network. Data reliability is ensured with RAID features that provide data security and recovery. Two Gigabit Ethernet ports enhance network efficiency, allowing the N299 to take over file management functions. The N299's user-friendly GUI supports multiple languages, and its built-in media server and optional wireless connectivity via USB dongles allow users to share and enjoy their digital media in virtually any room of the house.

## *Product Highlights*

### File Server

First and foremost, the N299 allows you to store and share files over an IP network. With a Network Attached Storage (NAS) device, you can centralize your files and share them easily over your network. With the easy-to-use web-based interface, users on your network can access these files in a snap.

To learn about the Web User Interface, go to **Chapter 5: Using the N299 > Web User Interface**.

### Media Server

The N299 can also act as a convenient media server, allowing you to enjoy and share photos, music, and movies via the uPnP AV streaming protocol.

To set up the Media Server, refer to **Chapter 4: Additional Feature Setup > Media Server**.

### FTP Server

With the built-in FTP Server, friends, clients, and customers can upload and download files to your N299 over the Internet with their favorite FTP programs. You can create user accounts so that only authorized users have access.

To set up the FTP Server, refer to **Chapter 4: Additional Feature Setup > FTP Server**.

### iTunes® Server

Digital music is one of the hottest trends, and with the built-in iTunes® server, you can share your digital music files with every iTunes-equipped PC on your network. The iTunes Server is also incredibly easy to set up!

To set up the iTunes Server, refer to **Chapter 4: Additional Feature Setup > iTunes Server**.

### Photo Gallery

Got a lot of photos? Share them effortlessly with the N299's built-in Photo Gallery. Users can create albums and upload photos in a snap, and the N299 will even auto-create thumbnails.

To find out how to share photos with the N299, refer to **Chapter 5: Using the N299 > Using Photo Gallery**.

### Backup Server

Don't leave precious data to chance. With advanced backup capabilities, you can easily upload mission critical files to the N299, and even automate your backup tasks for true peace-of-mind.

To find out how to backup your files with the N299, refer to **Chapter 5: Using the N299 > File Backup**.

### Download Manager

Tired having downloads take up all of your bandwidth when you need it most? With the N299's Download Manager, you can let the N299 complete your BT, HTTP, and FTP during off-peak hours. With the N299 lower power requirements, you can even save money off your monthly power bill.

To set up the Download Station, refer to **Chapter 4: Additional Feature Setup > Download Manager**.

### Printer Server

With the N299's Printer Server, you can easily share an IPP printer with other PCs connected to your network.

To set up the Printer Server, refer to **Chapter 4: Additional Feature Setup > Printer Server**.

### IP Cam Surveillence Server

Keep an eye on things with the built-in IP Cam Surveillence Server. Just plug in a compatible webcam and the N299 can send snapshots to an account that you specify. Best of all, your PC doesn't even have to be turned on!

To set up the IP Cam Surveillence Server, refer to **Chapter 4: Additional Feature Setup > IP Cam Surveillence**.

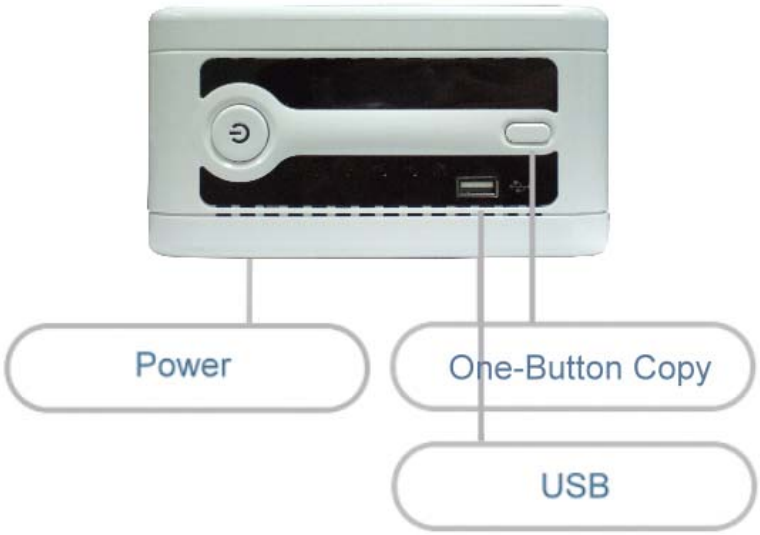
## *Package Contents*

Your N299 package should contain the following items:

- Thecus N299 NAS Device
- Accessory Pack:
  - Power cord
  - RJ-45 Ethernet cable
  - hard disk screws
  - hard disk tray screws
  - Installation CD
  - Quick Installation Guide
  - Warranty card

Please check to see if your package is complete. If you find that some items are missing, contact your dealer.

## *Front Panel*

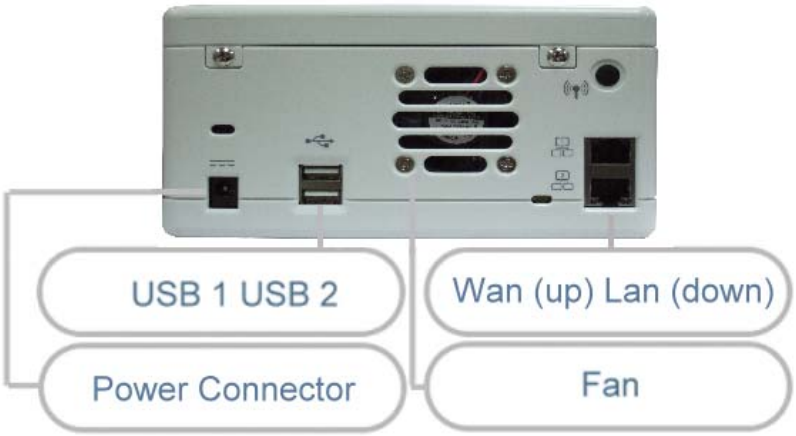



The N299's front panel displays the unit's array of status LEDs, and is also where you'll find the power button and USB port. See the table below for a detailed explanation of each:

| Item | Description |
|---|---|
| Power LED | • **Solid blue:** N299 is powered on |
| System Status LED | • **Blinking orange:** system is starting up<br>• **Blinking red:** system error<br>• **Off:** system startup complete; system operating normally |
| HDD1 LED | • **Solid blue:** HDD 1 detected<br>• **Blinking blue:** Active HDD 1 data transfer<br>• **Solid red :** HDD 1 error detected<br>• **Blinking red:** HDD 1 capacity is nearly full (90% or more)<br>* If RAID is configured, capacity is based on the entire RAID system. |
| HDD2 LED | • **Solid blue:** HDD 2 detected<br>• **Blinking blue:** Active HDD 2 data transfer<br>• **Solid red :** HDD 2 error detected<br>• **Blinking red:** HDD 2 capacity is nearly full (90% or more)<br>* If RAID is configured, capacity is based on the entire RAID system. |
| One-Button USB Copy | • **One-Button Copy**<br>Push once to copy entire USB volume to the N299. A short beep will sound to acknowledge that files are now being copied. Files are stored in a folder named by current time stamp: (YearMonthDayHHMM) |
| WAN LED | • **Solid green:** network link<br>• **Blinking green:** network activity |
| LAN LED | • **Solid green:** network link<br>• **Blinking green:** network activity |
| USB LED | • **USB Device Connection**<br>o **Blinking blue** (5 seconds): USB device connected successfully.<br>*For universal USB memory card readers, the USB LED will blink blue when one or more card is mounted successfully. |

| | |
|---|---|
| | o **Blinking red** (5 seconds): USB device connection failure<br>• **Data Transfer**<br>o **Blinking blue:** Active data transfer<br>o **Blinking red:** USB device read/write error |
| USB Port | • USB 2.0 port for USB storage expansion. |
| Power Button | • Power on/off N299 |

## *Rear Panel*




The rear panel of the N299 houses the USB and Ethernet connections, as well as the power connector. See the table below for descriptions of each:

| **Item** | **Description** |
|---|---|
| Power Connector | • Connect the included power cord to this connector |
| WAN Port | • WAN port for connecting to an Ethernet network through a switch or router |
| LAN Port | • LAN port for connecting to an Ethernet network through a switch or router |
| USB Ports | • USB 2.0 ports for storage expansion |

**NOTE**

**There are two USB ports at the back panel of N299, you can use either one, but not two at the same time.**

# Chapter 2: Getting Started

## *Overview*

Your N299 is designed for complete ease-of-use. To help you get started, the following chapter will help you get your N299 up and running in no time. Please read it carefully to prevent damaging your unit during installation.

## *Before You Begin*

Before you begin, be sure to take the following precautions:

1. Read and understand the ***Safety Warnings*** outlined in the beginning of the manual.

2. If possible, wear an anti-static wrist strap during installation to prevent static discharge from damaging the sensitive electronic components on the N299.

3. Be careful not to use magnetized screwdrivers around the N299's electronic components.

4. The N299 uses its chassis to dissipate heat. Please leave your N299 in a well-ventilated area to prevent overheating.

## *Hard Disk Installation*

The N299 supports standard 3.5" (SATA) hard disks. To install a hard disk into the N299, follow the steps below:

1. Remove two screws located on the back of the unit using a Philips screwdriver.

2. Unscrew four mounting screws.

3. Lift up the hard disk tray by pulling up the top panel of the N299.

4. Carefully insert a standard 3.5" SATA hard disk into the tray, and secure the hard disk with screws from the included accessory pack.

5. If you are installing two hard disks, please insert the second hard disk at the bottom of the tray and secure it with screws from the included accessory pack.

6. Carefully lower the hard disk tray back into the N299.

7. After making sure the tray is in place and the connectors are aligned, secure the hard disk tray with screws.

**NOTE** If your hard disk was previously part of a RAID 1 array, it will automatically rebuild. If you replace all the drives with higher capacity drives, you need to go to the Administrator login and format the drives.

## *Cable Connections*

Make the following connections on the Thecus N299 and then power up the unit:

1. Connect an Ethernet cable from your network to the WAN port on the back panel of the N299.

2. Connect the provided power cord into the universal power socket on the back panel. Plug the other end of the cord into a surge protected socket.

3. Press the power button on the front panel to power on the N299.

4. Make sure system is running properly by checking all front panel LEDs for any error indications.

## *Installation Wizard*

The handy Thecus Setup Wizard makes configuring N299 a snap. To configure the N299 using the Setup Wizard, perform the following steps:

1. Insert the installation CD into your CD-ROM drive (the host PC must be connected to the network).

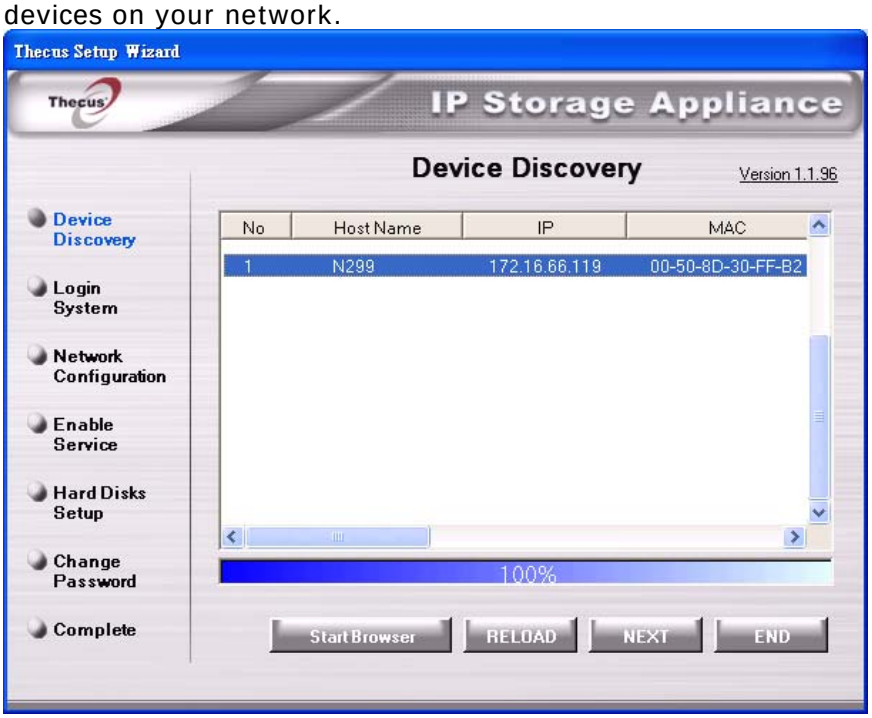
2. The Setup Wizard should launch automatically. If not, please browse your CD-ROM drive and double click on **Setup.exe.**

   **NOTE** For MAC OS X users, double click on Thecus Setup Wizard 1.1.6.dmg

3. Complete the Setup Wizard

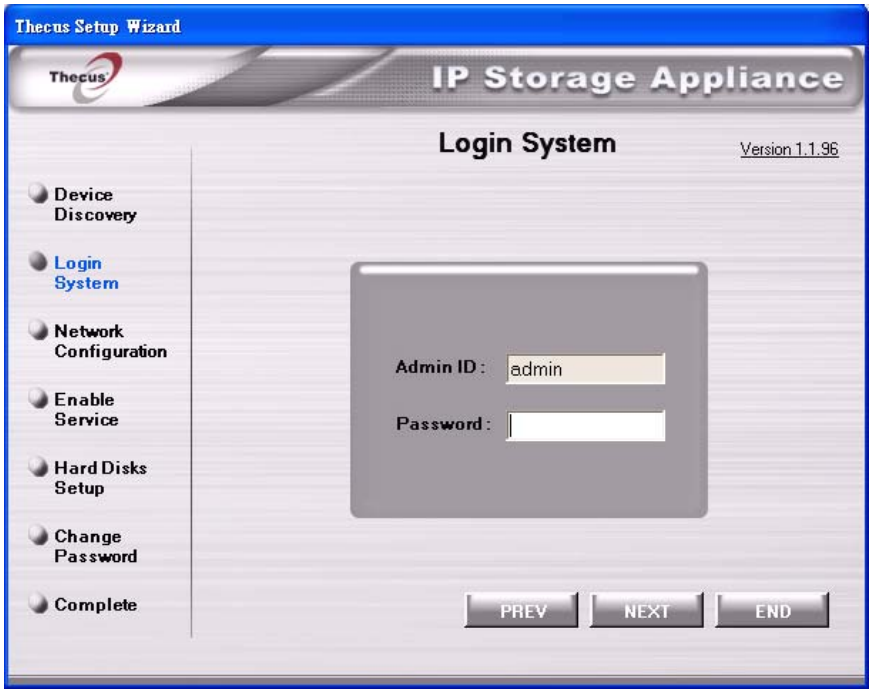
   **a. Device Discovery**

   The Setup Wizard will start and automatically detect all Thecus Storage devices on your network.



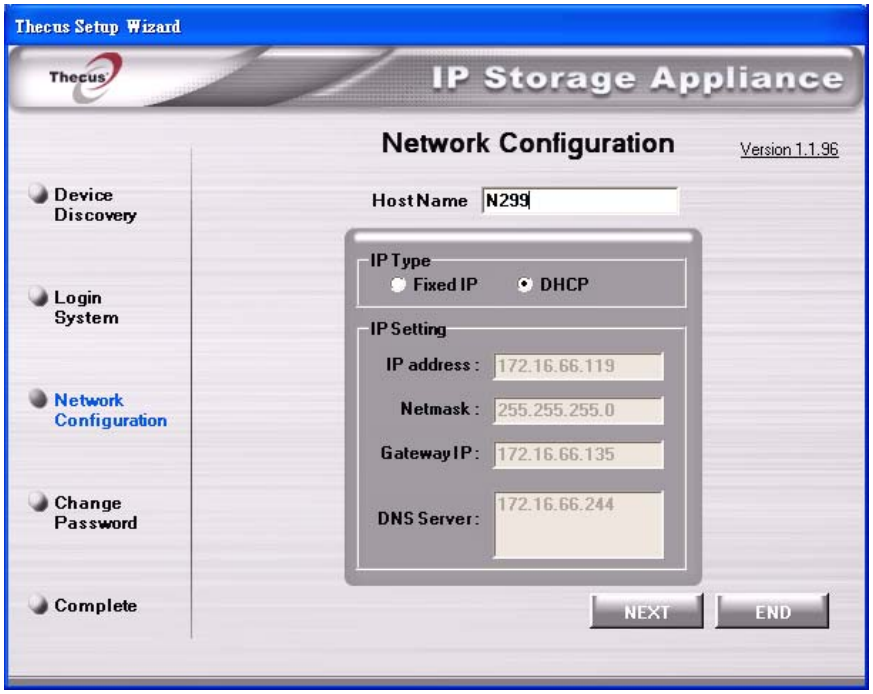
**b. Login**

Login into N299 with administrator's account and password.

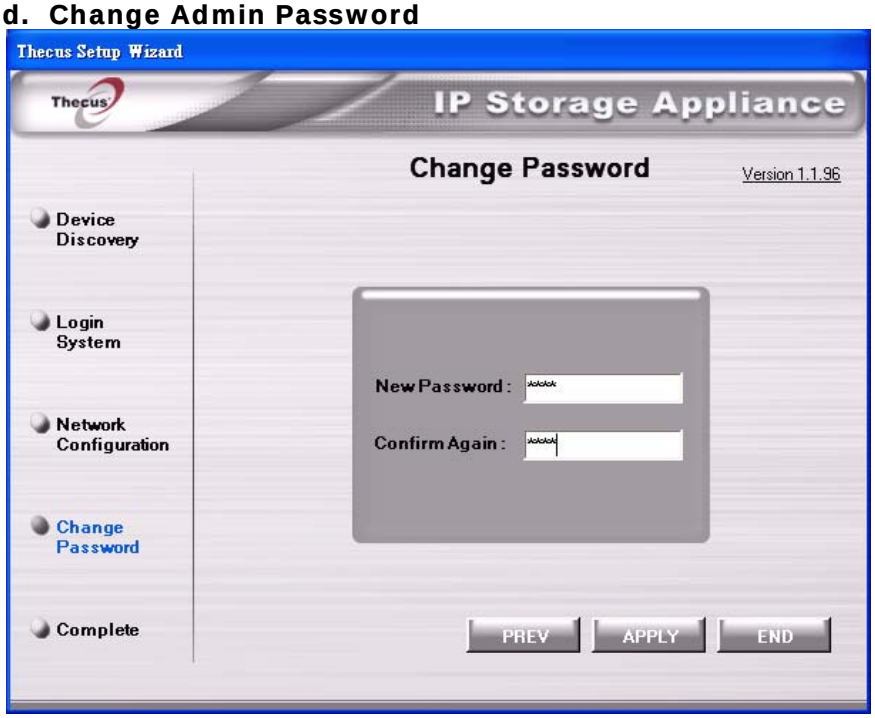



**c. Network Setting**

Name your N299 system and configure the network IP address. You can choose either fixed IP or DHCP.

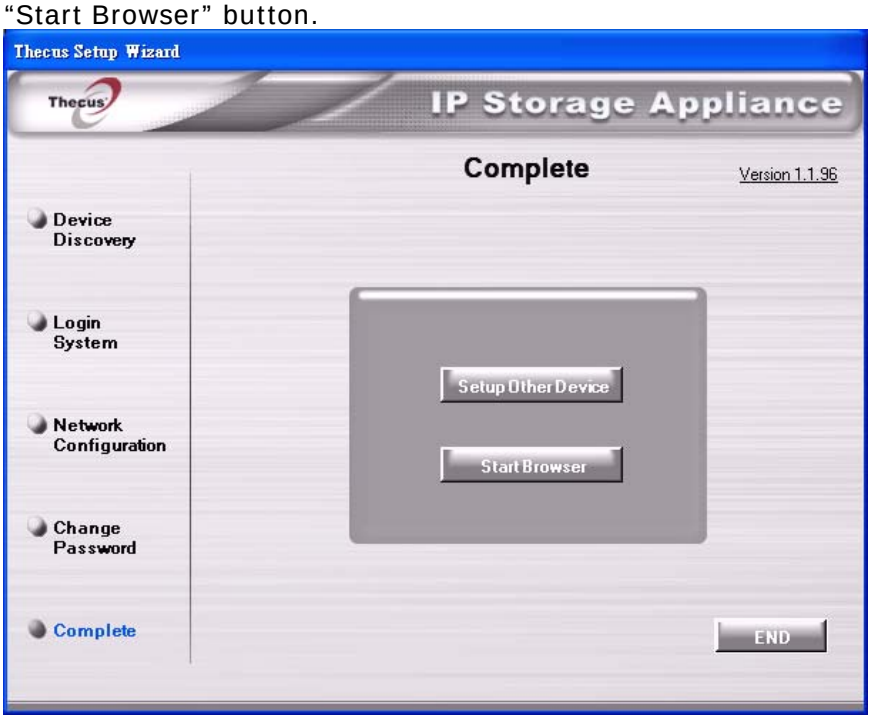


### d. Change Admin Password



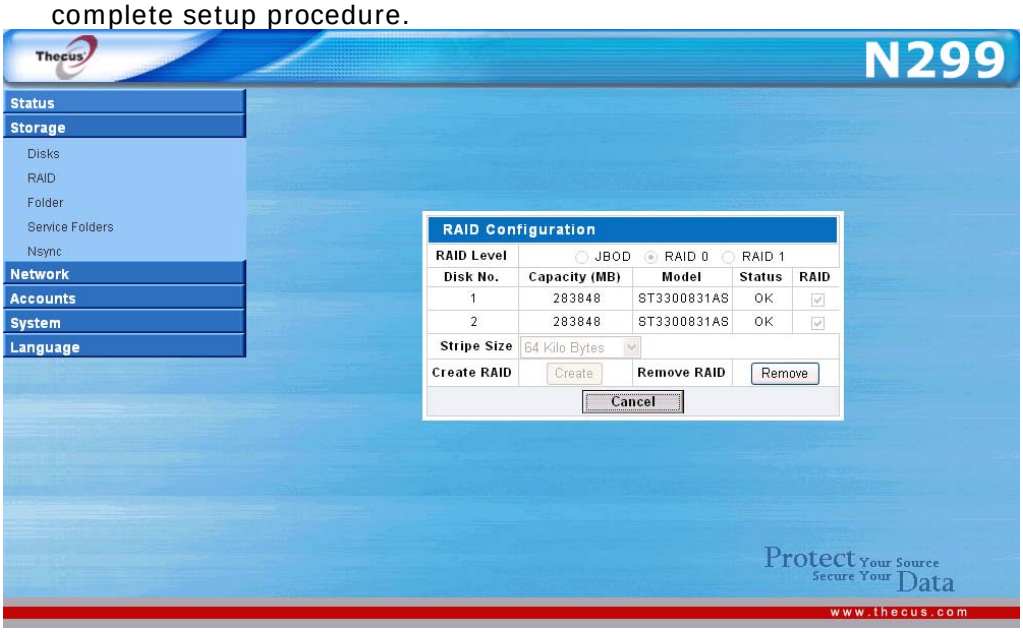

### e. Start Browser

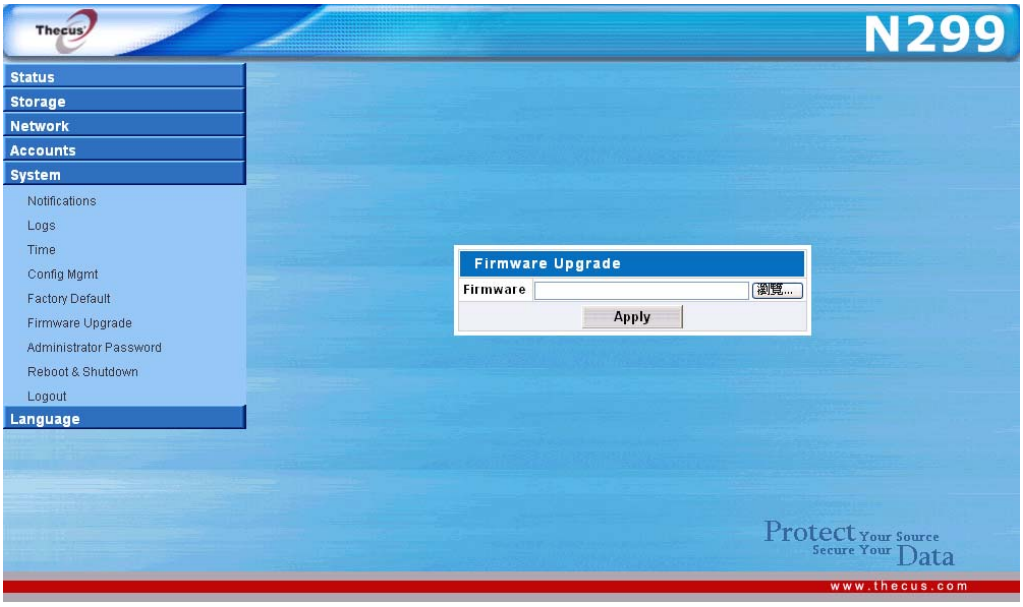
Access the current N299 administrator Web User Interface pressing the "Start Browser" button.



### f. RAID and FW installation

Please config the RAID first then carry on with FW installation to complete setup procedure.




**NOTE**

The Thecus Setup Wizard is designed for installation on systems running Windows XP/2000 or Mac OSX or later. Users with other operating systems will need to install the Thecus Setup Wizard on a host machine with one of these operating systems before using the unit.

## *First Time Setup*

Once the hardware is installed, physically connected to your network, and powered on, you can now configure the Thecus N299 so that it is accessible to your network users. Follow the steps below for initial software setup.

### Step 1: Initial Login

Make sure your network is connected to the Internet and access the N299 Login webpage:

1. Type in the default IP address `http://192.168.1.100` in your browser's address line. If you have changed the N299's IP address, type this in instead.

   **NOTE** To access any IP address, your computer must be configured with the correct IP settings. The IP address should be 192.168.1.x, where x is a number between 1 and 254.

2. The **Login** screen appears.

3. To gain initial access to the system type in the factory default administrator user name and password, which are as follows:

   User Name: `admin`
   Password: `admin`

4. Press ***Login***.

5. The **About** screen from the **Status** menu appears showing product information.

### Step 2: System Check and Configuration

Once logged in, you are greeted with the Web Administration Interface, where you can check the N299's status, as well as configure its operating parameters.

1. In the **Status** menu, choose the ***System*** item to go to the **System Status** screen. Check that the basic system information such as CPU loading and Fan RPM are all OK.

2. In the **Status** menu, choose the ***Info*** item to go to the **System Information** screen. Change the System Description to describe your system and press ***Apply***. This information appears on the **Login** page.

3. In the **System** menu, choose the ***Administrator Password*** item. The screen that appears lets you change the administrator password for the system. Press ***Apply*** to confirm your settings.

4. In the **System** menu, choose the ***Time*** item and the **Time** screen appears. Set the date, time and time zone and press ***Apply***.

### Step 3: Configure Network Settings

After setting the N299's basic configuration options, the next step is to configure its network settings.

1. In the **Network** menu, choose the ***WAN*** item and the **Network Configuration** screen appears.

2. Set host name and specify the domain name.

3. **Enable DHCP** for setting the IP automatically or **Disable DHCP** to enter your own IP settings.

4. Repeat steps 2 and 3 for the **LAN** item under the **Network** menu to configure the LAN port.

5. In the **Network** menu, choose the ***Service*** item and the **Service Support** screen appears.

6. **Enable** or **Disable** each protocol according to your requirements. Press ***Apply*** to confirm the setting.

**NOTE**

- For normal usage, enabling all protocols is recommended.
- For added security, disable WebDisk support and enable Secure WebDisk support.
- If DHCP is enabled in the Network Settings screen, UPnP is automatically enabled.

For details on configuring your network settings, refer to **Chapter 3: System Management > Network Management**.

### Step 4: Select RAID Level

Once the network is configured, you should then select the appropriate RAID level and build your RAID array.

1. From the **Storage** menu choose ***RAID*** item and the **RAID Information** screen appears. Press the ***Config*** button and the **RAID Configuration** screen appears.

2. Select your desired RAID mode.

**NOTE**

If security is your primary concern, for 2 disks, choose RAID 1. If capacity is your primary concern, choose JBOD or RAID 0. See Appendix C for more information.

3. Check the hard disks you wish to create a RAID on. Specify a stripe size—64K is a normal setting.

4. Press the ***Create*** button to build the RAID storage volume. Configuring RAID is usually only required for initial setup.

**NOTE**

Building a RAID storage space may take time, depending on the size of hard drives and RAID mode.

### Step 5: Create Local Users and Groups

After your RAID is built, you can begin to create local users and groups for the N299.

1. From the **Accounts** menu, choose ***Users*** item and the **Local User Configuration** screen appears. Click ***Add*** to add a new user.

2. Enter a name and password for each user in the **Name** and **Password** boxes and re-enter the password in the **Confirm Password** box.

3. Press the ***Apply*** button for each user and they will be added to the user list.

4. From the **Accounts** menu, choose ***Groups*** item and the **Local Group Configuration** screen appears. Click ***Add*** to add a new group.

5. Enter a group name in the Group Name box and click ***Apply*** to add the group to the group list.

For more on managing users, go to **Chapter 3: System Management > User and Group Management**.

### Step 6: Create Folders and Set Up ACLs

Once users are introduced into your network, you can begin to create various folders on the N299 and control user access to each using Folder Access Control Lists.

1. From the **Storage** menu, choose the ***Folder*** item and the **Folder** screen appears. Press the ***Add*** button and the ***Add Folder*** screen appears.

2. Enter the name and description of the folder and choose whether it is browseable. Press ***Apply*** to create the folder.

3. On the **Folder** screen press ***ACL*** (Access Control List) to configure which users have access to this folder.

4. On this screen, configure access to this folder for users and groups. Select a user or a group from the left hand column and then choose ***Deny Access***, ***Read Only***, or ***Writable*** to configure their access level. Press ***Apply*** to confirm settings.

**NOTE** You must set the ACL for each folder for access by specific users and groups; otherwise the folder is inaccessible to all users and groups.

For more information on managing folders, see **Chapter 3: System Management > Storage Management > Folder Management**.

To find out about configuring Folder Access Control Lists, see **Chapter 3: System Management > Storage Management > Folder Management > Folder Access Control List (ACL)**.

### Step 7: Start Services

Finally, you can start to setup the different services of the N299 for the users on your network. You can find out more about each of these services by clicking below:

**Windows Networking**
**Apple File Protocol (AFP)**
**FTP Server**
**iTunes® Server**
**Photo Gallery**
**Media Server**
**Download Manager**
**Printer Server**
**IP Cam Surveillance Server**

# Chapter 3: System Configuration

## *Overview*

The N299 provides an easily accessible web management interface. With it, you can configure and monitor the N299 anywhere on the network.

## *Web Administration Interface*

Make sure your network is connected to the Internet. To access the N299 **Login Page**:

1. Type the N299's IP address into your browser. (Default IP address is `http://192.168.1.100`)

**NOTE** Your computer's network IP address must be on the same subnet as the N299. If the N299 has default IP address of 192.168.1.100, your managing PC IP address must be 192.168.1.x, where x is a number between 1 and 254, but not 100.

2. Login to the system using the administrator user name and password. The factory defaults are:

   User Name: `admin`
   Password: `admin`

   If you changed your password in the setup wizard, use the new password.

Once you are logged in as an administrator, you will see the **Web Administration Interface**. From here, you can configure and monitor virtually every aspect of the N299 from anywhere on the network.

### Menu Bar

The **Menu Bar** is where you will find all of the information screens and system settings of the N299. The various settings are placed in the following groups on the menu bar:

| **Menu Bar** | |
|---|---|
| **Item** | **Description** |
| Status | Current system status of the N299. |
| Storage | Information and settings for storage devices installed into the N299. |
| Network | Information and settings for network connections and services, as well as various services of the N299. |
| Accounts | Allows configuration of users and groups. |
| System | Various N299 system settings and information. |
| Language | Choose your preferred language here. |

Clicking on any of these items will display the dropdown menu selections for each group.

In the following sections, you will find detailed explanations of each function, and how to configure your N299.

## *Language Selection*

The N299 supports multiple languages. On the menu bar, click ***Language*** and the **Change Language** screen appears. This screen allows you to select preferred language for the N299. The N299's interface supports the following languages:

- English
- Simplified Chinese
- Traditional Chinese
- German
- French
- Italian
- Japanese
- Korean
- Spanish

Press ***Apply*** to confirm your selection.

### Language Package Upload and Management

You can also upload additional language packs as they become available. To do this, press ***Upload*** and the **Language Package Upload / Management and User Upload Language Package List** screens appear.

To upload a language package, click ***Browse*** and browse for the language package location. Select the language package file and click ***Open***. Then, click ***Apply*** to upload the language package to the N299. Once uploaded, the language package will appear in the **User Upload Language Package List**.

| **User Upload Language Package List** | |
|---|---|
| **Item** | **Description** |
| Product | Name of language package. |
| Version | Language package version number. |
| Description | Language package description. |
| Remove Package | Click ***Remove*** to remove the selected language package. |

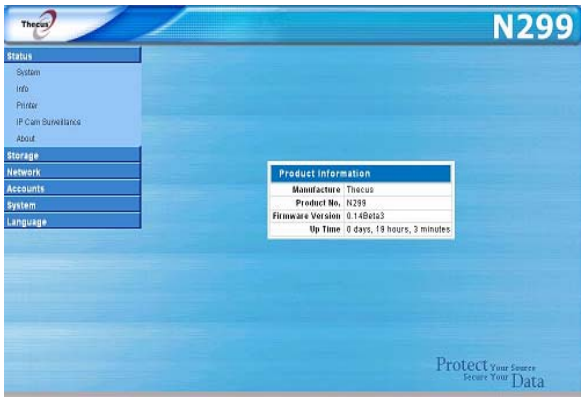
## *Status Menu*

The **Status** Menu on the menu bar allows you to see various aspects of the N299. From here, you can discover the status of the N299, and even find out other details like firmware version and up time.

### Product Information

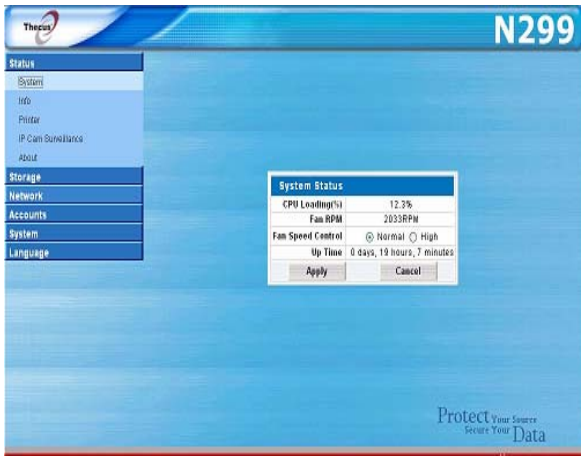
Once you login, you will first see the basic **Product Information** screen providing **Manufacturer**, **Product No.**, **Firmware Version**, and **Up Time** information.

To access this screen again, navigate to ***Status*** > ***About***.




### System Status

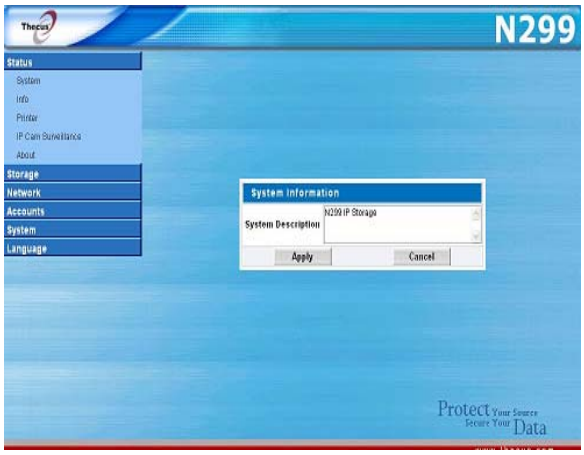
From the **Status** menu, choose the ***System*** item, and the **System Status** screen appears. This screen provides basic system status information.




| System Status | |
|---|---|
| **Item** | **Description** |
| CPU Loading (%) | Displays current CPU workload of the N299. |
| Fan RPM | Displays current RPM of the internal fan. |
| Fan Speed Control | You may select a desired fan speed from here. **Normal** and **High** fan speeds are available. Click ***Apply*** to save your changes. |
| Up Time | Shows how long the system has been running. |

## System Information

From **Status** menu, choose the ***Info*** item, and the **System Information** screen appears. You can change the system information that appears on uPnP devices screens (i.e. Network Neighborhood) on Windows-based systems by entering the new information here and pressing ***Apply*** to confirm.




| System Information | |
|---|---|
| **Item** | **Description** |
| System Description | Shows the system description that would also appear on the Login page. |

## Printer Status

**NOTE**

In order to use the Printer Server, you must first install the Printer Server module located on the installation CD. Once installed, the Printer Status option will appear on the Main Menu. See Chapter 4: Additional Feature Setup > Print Server for more details.

From the **Status** menu, choose the ***Printer*** item, and the **Printer Information** screen appears. The Printer Information screen provides the following information about the USB printer connected to the USB port.

| Printer Information | |
|---|---|
| **Item** | **Description** |
| Manufacturer | Displays the name of the USB printer manufacturer. |
| Model | Displays the model of the USB printer. |
| Status | Displays the status of the USB printer. |
| Printer Queue | Click to remove all documents from printer queue |

If a corrupt print job is sent to a printer, printing may suddenly fail. If your print jobs seem to be locked up, pressing the ***Remove All Documents*** button to clear the print queue may resolve the issue.

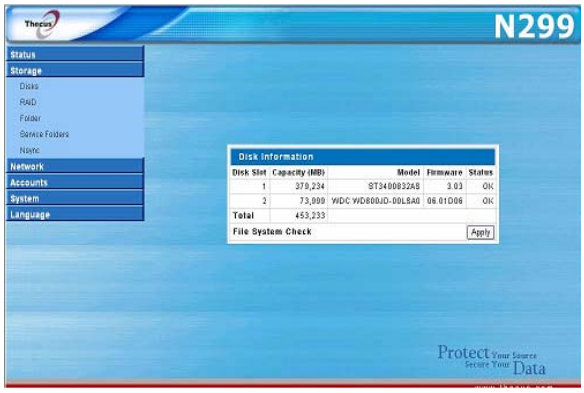
For information on how to set up the Printer Server, refer to **Chapter 4: Additional Feature Setup > Printer Server**.

## *Storage Management*

The **Storage Menu** displays the status of storage devices installed or connected to the N299, including disk and RAID information.

### Disk Information

From the **Storage** menu, choose the ***Disks*** item and the **Disk Information** screen appears. From here, you can see various items about installed SATA hard disks. Blank lines indicate that a SATA hard disk is not currently installed in that particular disk slot.

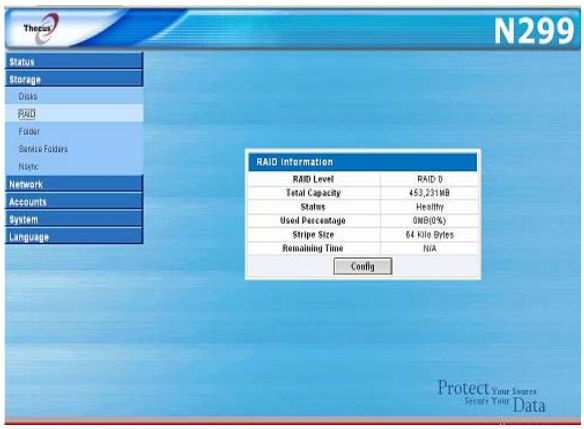



| SATA Information | |
|---|---|
| **Item** | **Description** |
| Disk Slot | Indicates disk location. |
| Capacity (MB) | Shows the SATA hard disk capacity. |
| Model | Displays the SATA hard disk model name. |
| Firmware | Shows the SATA hard disk firmware version. |
| Status | Indicates the status of the disk. Can read **OK**, **Warning**, or **Failed**. |
| Total | Shows the total SATA hard disk capacity. |
| File System Check | Click ***Apply*** to run a file system check on installed hard disks. |

**NOTE** Some services will scan the content directories, and this will keep the hard disk drive from spinning down.

### RAID Information

From the **Storage** menu, choose the ***RAID*** item and the **RAID Information** screen appears.



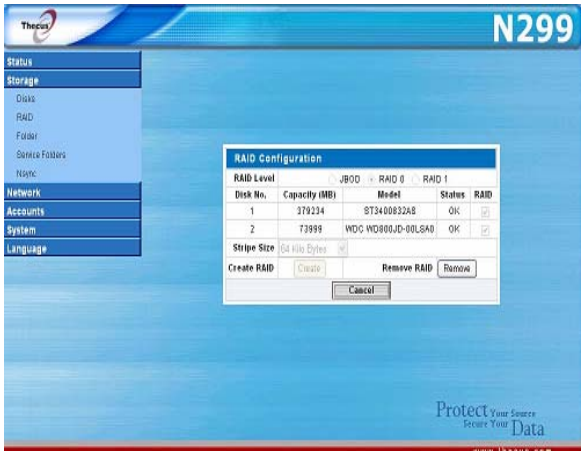

| RAID Information | |
|---|---|
| **Item** | **Description** |
| RAID Level | Shows the current RAID configuration. |
| Total Capacity | Shows total capacity of the RAID configuration. |
| Status | Indicates status of the RAID. Can read either ***Healthy*** or ***Failed***. |
| Used Percentage | Displays percentage of used RAID capacity. |
| Stripe Size | Shows the current disk stripe size. |
| Remaining Time | Indicates time remaining until the RAID is finished building. |

To configure your RAID settings, press the ***Config*** button to go to the **RAID Configuration** screen.

## RAID Configuration

On the **RAID Information** screen, press the ***Config*** button to go to the **RAID Configuration** screen. In addition to RAID disk information and status, this screen lets you make RAID configuration settings.

For more information on RAID, see **Appendix C: RAID Basics**.




### *RAID Level*

You can set the storage volume as either **None**, **JBOD**, **RAID 0**, or **RAID 1**. RAID configuration is usually required only when you first set up the device. A brief description of each RAID setting follows:

| **RAID Levels** | |
|---|---|
| **Level** | **Description** |
| None | There is no existing storage volume. |
| JBOD | The storage volume is a single HDD with no RAID support. JBOD requires a minimum of 1 disk. |
| RAID 0 | Provides data striping but no redundancy. Improves performance but not data safety. RAID 0 requires a minimum of 2 disks. |
| RAID 1 | Offers disk mirroring. Provides twice the read rate of single disks, but same write rate. RAID 1 requires a minimum of 2 disks. |

**WARNING** If the administrator improperly removes a hard disk that should not be removed when RAID status is degraded, all data will be lost.

### *Disk Settings*

Using **Disk Settings**, you can select stripe size, choose which disks are RAID disks.

| **Disk Settings** | |
|---|---|
| **Item** | **Description** |
| RAID | Check the boxes of the hard drives you wish to add to the storage volume. |
| Stripe Size | This sets the stripe size to maximize performance of sequential files in a storage volume. Keep the 64K setting unless you require a special file storage layout in the storage volume. A larger stripe size is better for large files. |
| Create RAID | Press this button to configure a file system and create the RAID storage volume. |
| Remove | Click to remove the RAID volume. All user data, snapshot, and Target USB data will be removed. |

### *Creating a RAID*

To create a RAID volume, follow the steps below:

1. On the **RAID Configuration** screen, set the RAID storage space as **JBOD**, **RAID 0**, or **RAID 1** — see **Appendix C: RAID Basics** for a detailed description of each.
2. Tick the checkboxes of the hard disks you wish to use to create a RAID.
3. Specify a stripe size — 64K is the default setting.
4. Press ***Create*** to build the RAID storage volume.

**NOTE** Building a RAID storage space may take time, depending on the size of hard drives and RAID mode.

**WARNING** Creating RAID destroys all data in the current RAID. The data is unrecoverable.

### *Deleting a RAID*

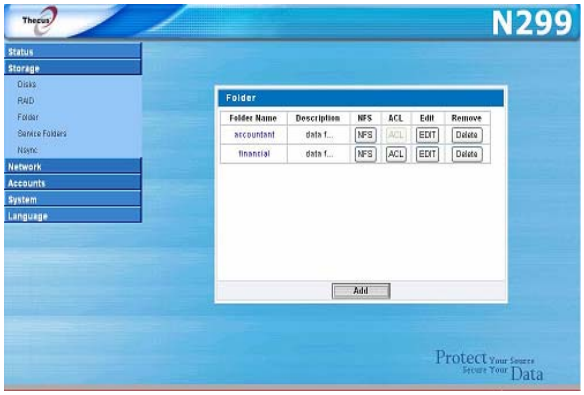
To delete a RAID volume, follow the steps below:

1. On the **RAID Configuration** screen, click ***Remove***.
2. The system automatically removes the RAID volume and you can create a new RAID.

**WARNING** Removing RAID destroys all data in the current RAID. The data is unrecoverable.

### Folder Management

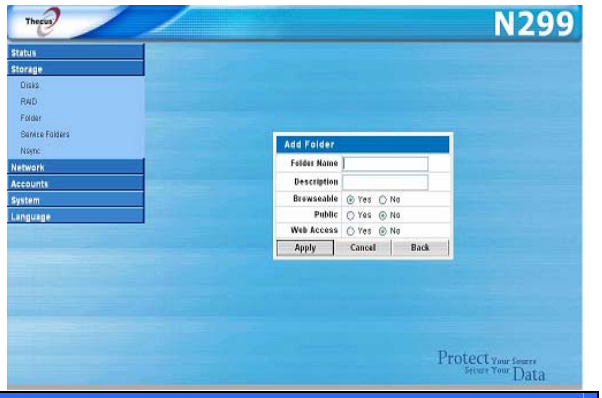
From the **Storage** menu, choose ***Folder***, and the **Folder** screen appears. This screen allows you to create and configure folders on the N299 volume.




| Folder | |
|---|---|
| **Item** | **Description** |
| Folder name | Displays the name of the folder. |
| Description | Provides a description of the folder. |
| NFS | Press **NFS** to setup access privilege. |
| ACL | Press ***ACL*** (Access Control List) to configure which users have access to this folder. |
| Edit | Press ***Edit*** to enter the **Edit** screen and modify the folder's name and description. |
| Del | Press ***Del*** to delete the folder. A screen appears asking to confirm the deletion. |
| Remove | Press **Remove** to delete folder. |
| Add | Press ***Add*** to enter the **Add Folder** screen. |

## *Adding Folders*

On the **Folder** screen, press the ***Add*** button and the **Add Folder** screen appears. This screen allows you to add a folder. After entering the information, press ***Apply*** to create new folder. Press ***Back*** to return to the **Folder** screen.




| Add Folder | |
|---|---|
| **Item** | **Description** |
| Folder Name | Enter the name of the folder. |
| Description | Provide a description the folder. |
| Browseable | Enable users to browse the folder content. |
| Public | Admit or deny public access to this folder. |
| Web Access | Admin or deny access through web disk. |
| Apply | Press ***Apply*** to create the folder. |
| Reset | Press ***Reset*** to clear entered data. |

**NOTE** Folder names are limited to 60 characters. Systems running Windows 98 or earlier may not support file names longer than 15 characters.

## *Editing Folders*

On the **Folder** screen, press the ***Edit*** button and the **Edit Folder** screen appears. This screen allows you to change folder information. After entering the information, press ***Apply*** to apply the changes. Press ***Back*** to return to the **Folder** screen.

| Edit Folder | |
|---|---|
| **Item** | **Description** |
| Description | Provide a description the folder. |
| Browseable | Enable users to browse the folder content. |
| Public | Admit or deny public access to this folder. |
| Web Access | Admin or deny access through web disk. |
| Apply | Press ***Apply*** to save your changes. |
| Cancel | Press ***Cancel*** to disregard entered data |
| Back | Press ***Back*** to return to upper page. |

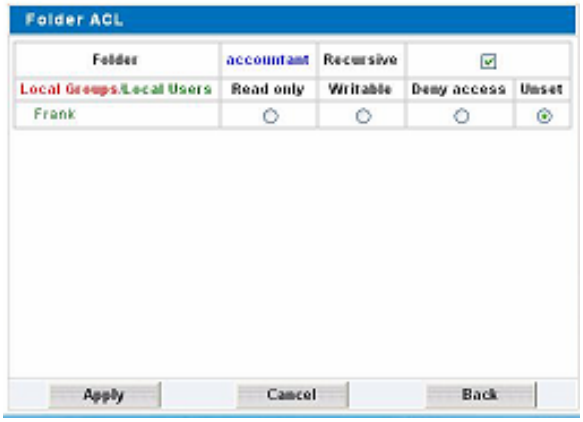
## *Deleting Folders*

To delete a folder, press the ***Del*** button from the specified folder row. The system will confirm folder deletion. Press ***OK*** to delete the folder permanently or ***Cancel*** to go back to the folder list.

**WARNING** All the data stored in the folder will be deleted once the folder is deleted. The data will not be recoverable.

### *Folder Access Control List (ACL)*

On the **Folder** screen, press the ***ACL*** button, and the **Folder Access Control List (Folder ACL)** screen appears. This screen allows you to configure access to the specific folder for users and groups. Use the ***Read only***, ***Writable, Deny access***, or ***Unset*** radio buttons to configure access levels for listed users and groups. Press the ***Apply*** button to confirm your settings.

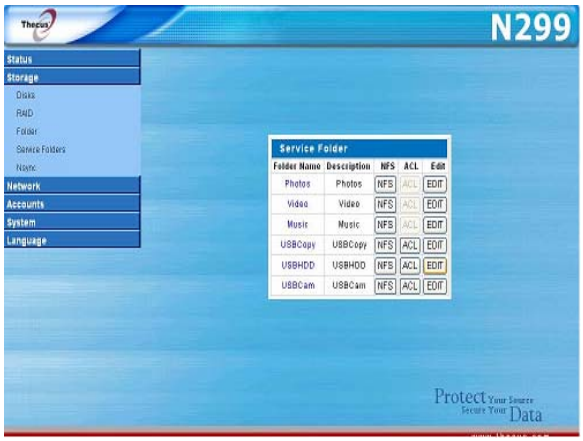



| Folder ACL | |
|---|---|
| **Item** | **Description** |
| Folder | Current folder name |
| Recursive | Check this box if you want your settings to also apply for all subfolders in current folder. |
| Local Groups/Local Users | Names of local groups and local users. Local groups are displayed in red, while local users are displayed in green. |
| Read Only | Provides Read Only access to users or groups. |
| Writable | Provides Write access to users or groups. |
| Deny | Denies access to users or groups. |
| Unset | Resets current user's/group's access privilages. |
| Apply | Click ***Apply*** to save your changes. |
| Cancel | Click ***Cancel*** to exit without saving changes. |
| Back | Click ***Back*** to return to the **Folder** screen. |

## Service Folders

The N299 automatically creates folders for its built-in applications.

To manage these service folders, select ***Service Folder*** from the **Storage** menu. Press ***NFS*** to setup access privilege. Press ***Edit*** to edit these folders. Press ***ACL*** to control access to these folders via the **Access Control List**.




| Service Folders | |
|---|---|
| **Folder Name** | **Description** |
| Photos | Default directory for your photos. |
| Video | Default directory for your video files. |
| Music | Music for the iTunes Server is located here. The iTunes server will share the music located in this directory. |
| USBCopy | Contents copied from the One-Touch USB Copy function are stored here. |
| USBHDD | Contents copied from USB hard disks are stored here. |
| IPCam | Stored still frames from the Simple Surveillance Server are stored here. |

## *Network Management*

Use the **Network** menu to make network configuration settings as well as service support settings.

### WAN Configuration

From the **Network** menu, choose ***WAN***, and the **WAN Configuration** screen appears. This screen displays the network parameters of the WAN connection. You may change any of these items and press ***Apply*** to confirm your settings. You can see a description of each item in the following table:

| WAN Configuration | |
|---|---|
| **Item** | **Description** |
| Host name | Host name that identifies the N299 on the network. |
| Domain name | Specifies the domain name of the N299. |
| MAC Address | Display the WAN port MAC address. |
| Jumbo Frame Support | Enable or disable Jumbo Frame Support of the WAN interface on your N299. |
| Connection Type | The WAN IP can be set to a Static IP, Dynamic IP, or PPPoE.<br>**Static:** Administrator has to enter IP, Netmask, Gateway, DNS Server fields.<br>**Dynamic:** If there is already a DHCP server on your network, you can let the DHCP server assign an IP address to your N299. NOTE: If this is set to Dynamic, but a DHCP server is not detected on the WAN network, the IP address of the N299 will reset to the default setting of `192.168.1.100`.<br>**PPPoE:** The N299 can also support a direct connection to an ASDL modem through PPPoE. Once selected, you will need to enter a User Name and Password. |
| User Name | Enter your user name for PPPoE connection. (PPPoE only) |
| Password | Enter your password for PPPoE connection. (PPPoE only) |
| IP | IP address of the WAN interface. |
| Netmask | Network mask, which is generally: `255.255.255.0` |
| DNS Server | Domain Name Service (DNS) server IP address. |
| IP Sharing Mode | When enabled, traffic on the LAN will be directed to the WAN. Default is **Disabled**. |
| PPPoE Connect | Connect or disconnect from a PPPoE connection. (PPPoE only) |

**NOTE**

- Only use Jumbo Frame settings when operating in a Gigabit environment where all other clients have Jumbo Frame Setting enabled.
- Enabling DHCP automatically turns on UPnP — See the **Service Support** Screen.
- If you are only using the WAN port, we suggest that you disable IP Sharing Mode. This will result in higher throughput.
- A correct DNS setting is vital to networks services, such as SMTP and NTP.

**WARNING**

Most Fast Ethernet (10/100) Switches/Routers do not support Jumbo Frame and you will not be able to connect to your N299 after Jumbo Frame is turned on. If this happens, turn off the N299. Then, power on the N299 and immediately press and hold the Reset button on the front of the unit for 10 seconds. This will reset your network settings, password, and turn off Jumbo Frame Support.

## LAN Configuration

The N299 supports a second Ethernet port for higher service availability. To configure these ports, choose ***LAN*** from the **Network** menu, and the **LAN Configuration** screen appears. Press ***Apply*** to save your changes.

| LAN Configuration | |
|---|---|
| **Item** | **Description** |
| MAC Address | Displays the MAC address of the LAN interface. |
| Jumbo Frame Support | Enable or disable Jumbo Frame Support on the LAN interface. |
| IP | Specifies the IP address of the LAN interface. |
| Netmask | Specifies the Network Mask of the LAN interface. |
| **DHCP Server Configuration** | |
| **Item** | **Description** |
| DHCP Server | Enable or disable the DHCP server to automatically assign IP addresses to PCs connected to the LAN interface. Default is **Disabled**. |
| Start IP | Specifies the starting IP address of the DHCP range. |
| End IP | Specifies the ending IP address of the DHCP range. |
| DNS Server | Specifies the DNS server IP address. |
| Apply | Click ***Apply*** to save your changes. |
| Cancel | Click ***Cancel*** to abandon your changes. |

**NOTE**

- Before enabling Jumbo Frame Support, please make sure your network equipment supports Jumbo Frame. If your equipment is incompatible, you might not be able to connect to your N299. In this case, you have to reset the system back to default by the holding down front panel reset button for 5 seconds during boot up process.
- The IP Segment of WAN and LAN should not overlap.

**DD**

**WARNING**

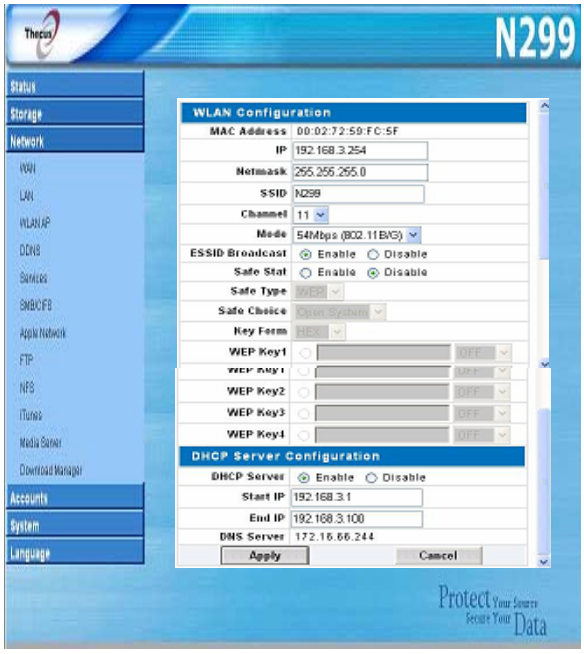
## NS Configuration

The N299 also features Dynamic DNS support. To configure DDNS, choose ***DDNS*** from the **Network** menu. Press ***Apply*** to confirm your settings.

| DDNS Support | |
|---|---|
| **Item** | **Description** |
| Register | Support www.dyndns.org, www.zoneedit.com, www.tzo.com |
| User Name | Input user name that you have register in DDNS domain. |
| Password | Input password that you have register in DDNS domain. |
| Domain Name | Input registered domain name. |
| Apply | Click ***Apply*** to save your changes. |
| Cancel | Input Click ***Cancel*** to abandon your changes. |

## WLAN Configuration

When a compatible wireless USB dongle is installed on the N299, the N299 will become an access point, and the **Network** dropdown menu will contain a **WLAN** menu item. From the **Network** menu, choose ***WLAN***, and the **WLAN Configuration** screen appears. This screen displays the wireless network parameters of the system. You can to change any of these items and press ***Apply*** to confirm your settings.




**NOTE**

- Currently supported USB wireless dongles are: 3Com 3CRUSB10075, Zyxel G220USB, PCI GW-US54mini.
- USB dongles have to be connected before N299 is powered up.

| WLAN Configuration | |
|---|---|
| **Item** | **Description** |
| MAC Address | Displays the MAC Address of the USB wireless dongle. |
| IP | Specifies the IP address of the network connection. |
| Netmask | Specifies the network mask, which is generally: 255.255.255.0 |
| ESSID | The ESSID (Extended Service Set Identification) is the identifying name of a wireless network. |
| ESSID Broadcast | Specifies whether the ESSID will be broadcasted by the N299. This will prevent the Access Point from broadcasting the ESSID. The N299 will still respond to a wireless device that LAN1ts to communicate if it sends a matching ESSID. |
| Channel | The channel that the N299 uses to communicate with client devices. |
| Auth Mode | Authentication mode used by the N299.<br>**Shared:** Shared key authentication<br>**Open:** Open key authentication |
| WEP Enable | Specifies whether to use encryption for transmission or not. |
| Key Length | Key length specifies the level of encryption used by the N299.<br>64 bit: 10 characters from 0 ~ 9 and A ~ F.<br>128 bit: 26 characters from 0 ~ 9 and A ~ F. |
| WEP KEY 1 | Input up to 4 WEP keys, and select the one you wish to use. When connecting, be sure to enter the same key and select the same index number on each client machine. |
| WEP KEY 2 | |
| WEP KEY 3 | |
| WEP KEY 4 | |

A DHCP server can be configured to assign IP addresses to wirelessly connected devices.

| WLAN DHCP Configuration | |
|---|---|
| **Item** | **Description** |
| DHCP Server | Select to enable or disable DHCP server. |
| Start IP | Specifies the starting IP address of the DHCP range. |
| End IP | Specifies the ending IP address of the DHCP range. |
| DNS Server | Specifies the DNS server IP address. |

**NOTE**

The IP Segment of WLAN, WAN and LAN should not overlap.

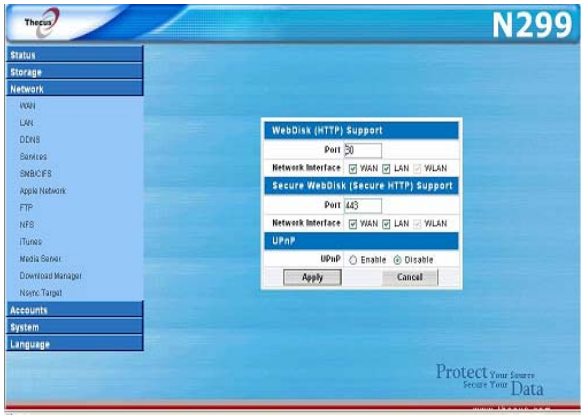
**NOTE**

Users should obey the international RF regulatory rules as they set up the wireless RF channel on the N299. The RF operating channels for different regions have been specified as following. Thecus has no responsibility for users attempting to violate the international RF regulation.

| | |
|---|---|
| 11 | N. America |
| 14 | Japan |
| 13 | Europe (ETSI) |
| 2 | Spain |
| 4 | France |

## Web Services Configuration

From the **Network** menu, choose the ***Services*** item, and the **Web Service** screen appears. This screen displays the service support parameters of the system. You can change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:




| Web Service | |
|---|---|
| **Item** | **Description** |
| HTTP (WebDisk) Support | Enable or disable WebDisk support. Enter the port number if this option is enabled. |
| HTTPs (Secure WebDisk) Support | Enable or disable Secure WebDisk support. Enter the port if this option is enabled. |
| UPnP | Enable or disable Universal Plug and Play protocol. UPnP helps to find the IP address of the N299. |

**NOTE**

Disable HTTP support and Enable Secure HTTP support to guarantee secure access.

## Windows Network Configuration (SMB/CIFS)

The N299 can act as a Samba server, enabling users to share files using the SMB/CIFS protocol. From the **Network** menu, choose the ***SMB/CIFS*** item, and the **SMB/CIFS** screen appears. You can change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:

| SMB/CIFS | |
|---|---|
| **Item** | **Description** |
| Sharing | If you are using Microsoft Windows®, enable this service to access the files on the N299 by mapping a network drive. |
| WINS Server | Specify the WINS server IP address, if your network has a WINS server installed. The N299 will automatically register its name and IP address with WINS service. |
| Work Group / Domain Name | Enable or disable SMB/CIFS protocol for Windows, Apple, Unix drive mapping. |

**NOTE**

- SMB/CIFS service also allows file sharing from Mac OSX and Linux platforms.
- Once a Mac OS accesses a share folder, it will create a file named .DS_Store, and directories named Temporary items, Network Trash Folder, .Apple Double, Apple Desktop and AppleDB in the share folder.

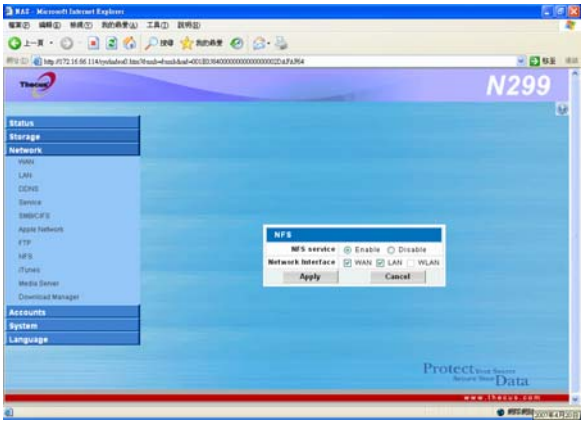
## Apple Network Setup

From the **Network** menu, choose the ***Apple Network*** item, and the **Apple Network Configuration** screen appears. This screen displays the configuration items for the Apple Filing Protocol. You can change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:

| Apple Network Configuration | |
|---|---|
| **Item** | **Description** |
| Apple File Service | Enable Apple File Service to use the N299 on MAC OS-based system. |
| MAC CHARSET | If your operating system does not support Unicode (e.g. MAC OS9/8), select the same language as your OS here in order to properly view the files and directories on the server. |
| Zone | Specifies Zone for Applet Talk service.<br>If your AppleTalk network uses extended networks and is assigned with multiple zones, assign a zone name to the N299. If you do not Want to assign a network zone, enter an asterisk (*) to use the default setting. |

## NFS Setup

From the **Network** menu, choose the ***NFS*** item, and the **NFS** server setting screen appears. The N299 can act as a NFS server, enabling users to download and upload files with their favorite NFS clients. Make your changes, and then click ***Apply*** to save them. Click ***Cancel*** to return to the main menu.



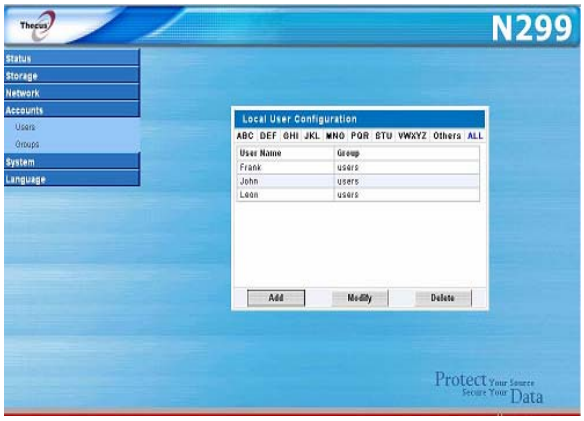

| NFS | |
|---|---|
| **Item** | **Description** |
| NFS Service | Enable or disable NFS support |
| Network Interface | Select the network interface for NFS service. |

## *User and Group Management*

The N299 has built-in user database that allows administrators to manage user access using different group policies. From the **Accounts** menu, you can create, modify, and delete users, and assign them to groups that you designate.

### Local User Configuration

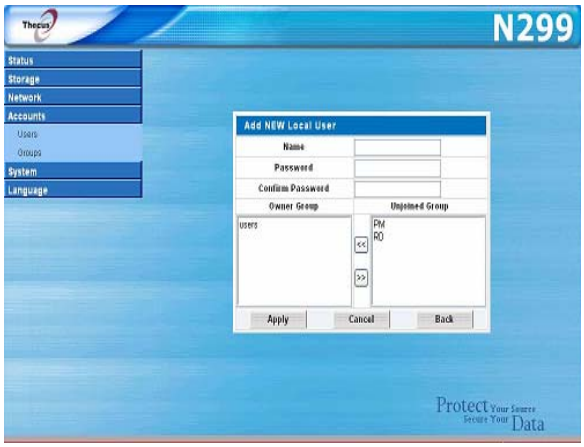
From the **Accounts** menu, choose the **Users** item, and the **Local User Configuration** screen appears. This screen allows you to **Add**, **Modify**, and **Delete** local users.




You can quickly find a particular user name by clicking one of the letter groupings at the top of the window. For example, to find a user name beginning with the letter M, click the ***MNO*** user group, and the user names beginning with M, N, or O will be listed. To see all names, click ***ALL***.

| **Local User Configuration** | |
|---|---|
| **Item** | **Description** |
| User Name | Current user name. |
| Group | Group membership of current user name. |
| Add | Press the ***Add*** button to add a user to the list of local users. |
| Modify | Press the ***Modify*** button to modify a local user. |
| Delete | Press the ***Delete*** button to delete a selected user from the system. |

### *Adding Users*




1. Click on the ***Add*** button on **Local User Configuration** screen, and **Add NEW Local User** screen appears.

2. Enter a name in the **User Name** box.

3. Enter a password in the **Password** box and re-enter the password in the **Confirm Password** box.

4. Select which group the user will belong to. The **Owner Group** list is a list of groups this user belongs to. The **Unjoined Group** list is a list of groups this user does not belong to. Use the **<<** or **>>** buttons to have this user join or leave a group.

5. Press the ***Apply*** button and the user is created.

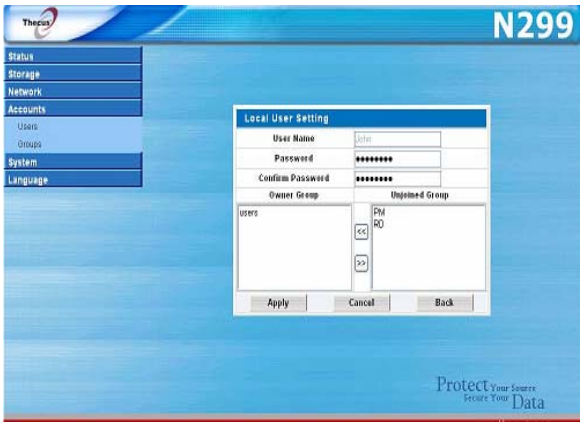
**NOTE** All users are automatically assigned to the 'users' group.

### *Modifying Users*

1. Select an existing user from the **Local User Configuration** screen.

2. Click on the ***Modify*** button, and **Local User Setting** screen appears.

3. From here, you can enter a new password and re-enter to confirm, or use the **<<** or **>>** buttons to have this user join or leave a group. Click the ***Apply*** button to save your changes.




### *Deleting Users*

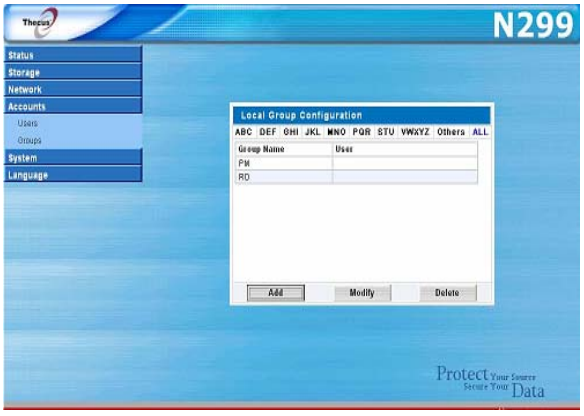
1. Select an existing user from the **Local User Configuration** screen.

2. Click on ***Delete*** button and the user is deleted from the system.

## Local Groups Configuration

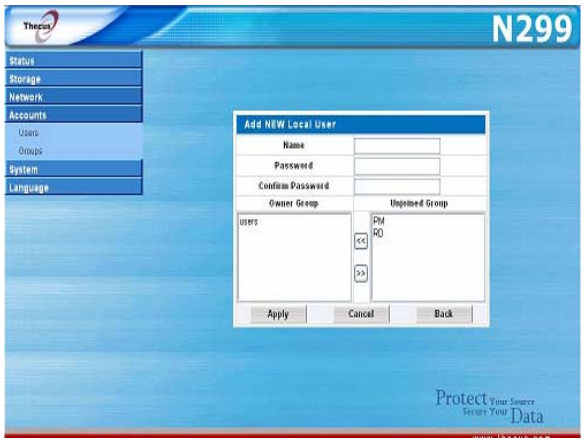
From the **Accounts** menu, choose the ***Groups*** item, and the **Local Group Configuration** screen appears. This screen allows you to **Add**, **Modify**, and **Delete** local groups.

You can quickly find a particular group by clicking one of the letter groupings at the top of the window. For example, to find a user name beginning with the letter M, click the ***DEF*** letter group, and the groups beginning with M, N, or O will be listed. To see all groups, click ***ALL***.



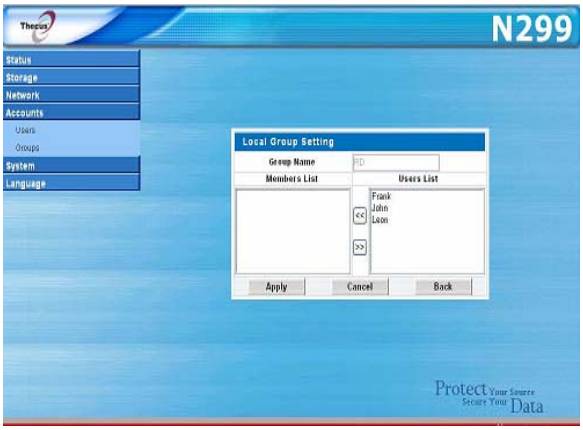

| Local Groups Configuration | |
|---|---|
| **Item** | **Description** |
| Group Name | Current group name. |
| User | Users currently in current group. |
| Add | Press the ***Add*** button to add a user to the list of local groups. |
| Modify | Press the ***Modify*** button to delete a selected group from the system. |
| Delete | Press the ***Delete*** button to delete a selected group from the system. |

### *Adding Groups*




1. On the **Local Group Configuration** screen, click on the ***Add*** button.
2. The **Add NEW Local Group** screen appears.
3. Enter a **Group Name**, and select users to be in this group from the **Users List** by adding them to the **Members List** using the **<<** button.
4. Click the ***Apply*** button to save your changes.

### *Modifying Groups*




1. On the **Local Group Configuration** screen, select a group name from the list.
2. Press the ***Modify*** button and the Local Group Setting screen appears.
3. To add a user into a group, select the user from the **Users List**, and press the **<<** button to move the user into the **Members List**.
4. To remove a user from a group, select the user from **Members List**, and press the **>>** button.
5. Click the ***Apply*** button to save your changes.

### *Deleting Groups*

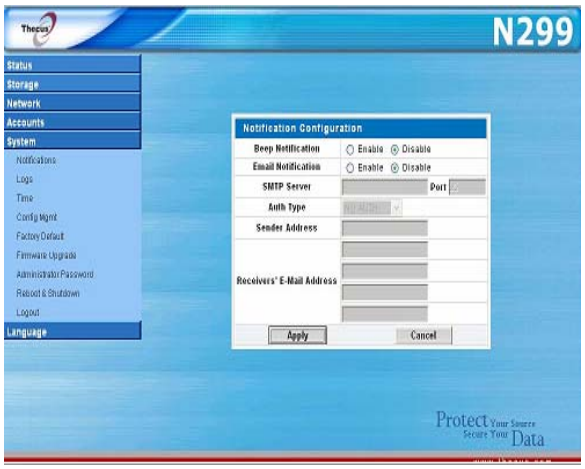
1. On the **Local Group Configuration** screen, select a group name from the list.
2. Press ***Delete*** to delete the group from the system.

## *System Management*

The **System** menu gives you a wealth of settings that you can use to configure your N299's system administration functions. You can set up system notifications, view system logs, and even upgrade firmware from this menu.

### System Notifications

From the **System** menu, choose the ***Notification*** item, and the **Notification Configuration** screen appears. This screen lets you have the N299 notify you in case of any system malfunction. Press ***Apply*** to confirm all settings. See following table for a detailed description of each item.

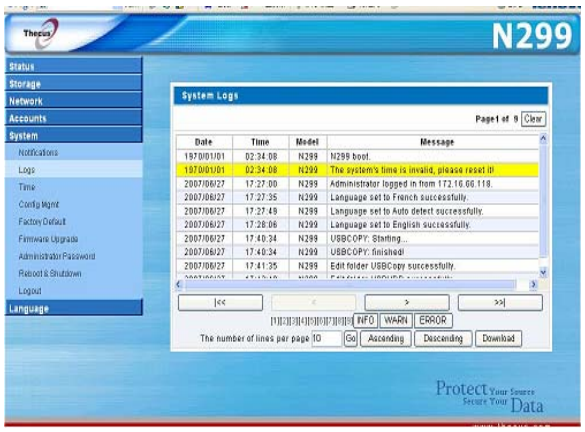



| Notification Configuration | |
|---|---|
| **Item** | **Description** |
| Beep Notification | Enable or disable the system beeper that beeps when a problem occurs. |
| Email Notification | Enable or disable email notifications of system problems. |
| SMTP Server | Specifies the hostname/IP address of the SMTP server. |
| Port | Specifies the port to send outgoing notification emails. |
| Auth Type | Select the SMTP Server account authentication type. |
| Sender Address | Set the sender mail address. |
| Sender Password | Enter the password for the sender's mail account. |
| Confirm Password | Confirm a new password. |
| Receivers' E-mail Address | Add one or more recipient's email addresses to receive email notifications. |
| Send Test Mail | Click to send out a test e-mail to make sure the settings are correct. |

**NOTE** Consult with your mail server administrator for email server information.

### System Logs

From the **System** menu, choose the **Logs** item and the **System Logs** screen appears. This screen shows a history of system usage and important events such as disk status, network information, and system booting. See the following table for a detailed description of each item:



| System Logs | |
|---|---|
| **Item** | **Description** |
| Truncate All Log File | Clear all log files. |
| \|<< < > >>\| | Use the forward ( **> >>\|** ) and backward ( **\|<< <** ) buttons to browse the log pages. |
| INFO | Provides all log information including warning messages and error messages. |
| WARN | Shows all warning messages and error messages. |
| ERROR | Shows only error messages. |
| GO | Specify the number of lines per page and press Go. |
| Ascending | Shows logs by date in ascending order. |
| Descending | Shows logs by date in descending order. |
| Download All Log File | Export all logs to an external file. |

## Time and Date Settings

From the **System** menu, choose the **Time** item and the **Time** screen appears. Set the desired **Date**, **Time**, and **Time Zone**. You can also elect to synchronize the system time on the N299 with an **NTP (Network Time Protocol) Server**. You can change any of these items and press ***Apply*** to confirm your settings. See the following table for a detailed description of each item:

| Time | |
|---|---|
| **Item** | **Description** |
| Date | Sets the system date. |
| Time | Sets the system time. |
| Area | Select your area. |
| City | Select your city. |
| NTP Server | Select ***Yes*** to allow the N299 to synchronize with the NTP server shown below.<br>Select ***Maually*** to allow the N299 to synchronize with an NTP server of your choice.<br>Select ***No*** to not have the N299 to synchronize with an NTP server. |

**WARNING** If an NTP server is selected, please make sure your N299's network has been setup to access the NTP server.

## System Configuration Backup and Restore

From the **System** menu, choose the ***Config Mgmt*** item and the **System Configuration Download / Upload** screen appears. From here, you can download or upload stored system configurations. See the following table for a detailed description of each item.

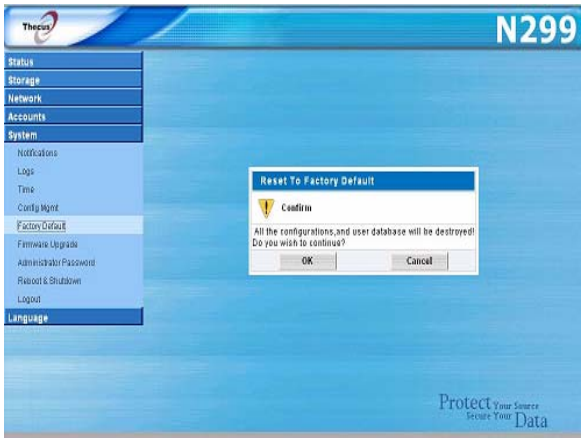
| System Configuration Download / Upload | |
|---|---|
| **Item** | **Description** |
| Download | Save and export the current system configuration. |
| Browse | Click to browse the folder of your PC to locate the configuration files. |
| Upload | Import a saved configuration file to overwrite current system configuration. |

**NOTE**

Backing up your system configuration is a great way to ensure that you can revert to a working configuration when you are experimenting with new system settings.

## Reset to Factory Default Settings

From the **System** menu, choose the ***Factory Default*** item and the **Reset to Factory Default** screen appears. Press ***Apply*** to reset the N299 to factory default settings. Press ***Cancel*** to go back to the main menu.

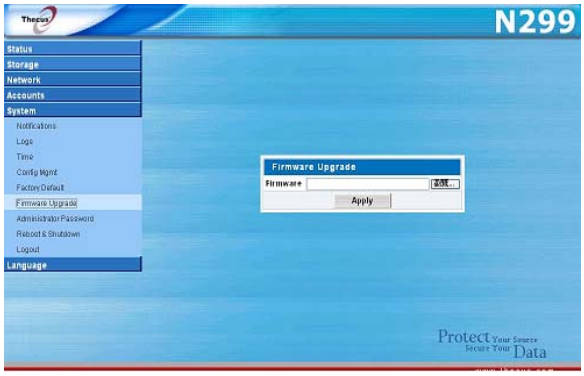



**WARNING**

Resetting to factory defaults will not erase the data stored in the hard disks, but WILL revert all the settings to the factory default values.

## Upgrading System Firmware

From the **System** menu, choose the ***Firmware Upgrade*** item and the **Firmware Upgrade** screen appears.




Follow the steps below to upgrade your firmware:

1. Use the ***Browse*** button to find the firmware file.
2. Press ***Apply***.
3. The beeper beeps and the Busy LED blinks until the upgrade is complete.

**NOTE**

- *The beeper only beeps if it is enabled in the System Notification menu.*
- *Check Thecus website for the latest firmware release and release notes.*

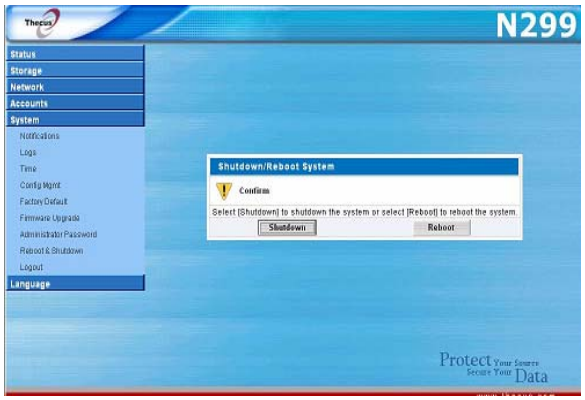
## Change Administrator Password

From the **System** menu, choose the ***Administrator Password*** item and the **Change Administrator Password** screen appears. Enter a new password in the **New Password** box and confirm your new password in the **Confirm Password** box. Press ***Apply*** to confirm password changes. See the following table for a detailed description of each item.

| Change Administrator Password | |
|---|---|
| **Item** | **Description** |
| Old Password | Type in the current administrator password. |
| New Password | Type in a new administrator password. |
| Confirm Password | Type the new password again to confirm. |
| Apply | Press this to save your changes. |

## Reboot and Shutdown System

From the **System** menu, choose **Reboot & Shutdown** item, and the **Shutdown/Reboot System** screen appears. Press ***Reboot*** to restart the system or ***Shutdown*** to turn the system off.




## Logout

To logout of the Web Administration Interface, navigate to ***System*** > ***Logout***.

# Chapter 4: Additional Feature Setup

## *Overview*

With a bevy of additional features and services, the N299 is so much more than a mere external hard disk. The sections below show you how you can utilize your N299 to serve files, music, movies, pictures, and more.

## *FTP Server*

N299 can act as a FTP server, enabling users to download and upload files with their favorite FTP programs. From the **Network** menu, choose the ***FTP*** item, and the **FTP** screen appears. You can change any of these items and press ***Apply*** to confirm your settings. A description of each item follows:

| FTP | |
|---|---|
| **Item** | **Description** |
| FTP | Enable FTP Service on the N299. |
| FTP ENCODE | If your FTP client or operating system does not support Unicode (e.g. Windows® 95/98/ME or MAC OS9/8), select the same encoding as your OS here in order to properly view the files and directories on the server. Available options are BIG5, HZ, GB2312, GB18030, ISO, EUC-JP, SHIFT-JIS and UTF-8. |
| Port | Specifies the port number of an incoming connection on a non-standard port. |
| Allow Anonymous FTP Access | **Upload / Download:** Allow anonymous FTP users to upload or download files to/from public folders.<br>**Download:** Allow anonymous FTP users to download files from public folders.<br>**No access:** Block anonymous FTP user access. |
| Network Interface | Select which network interface the FTP server will use. WAN, LAN or WLAN can be selected. |

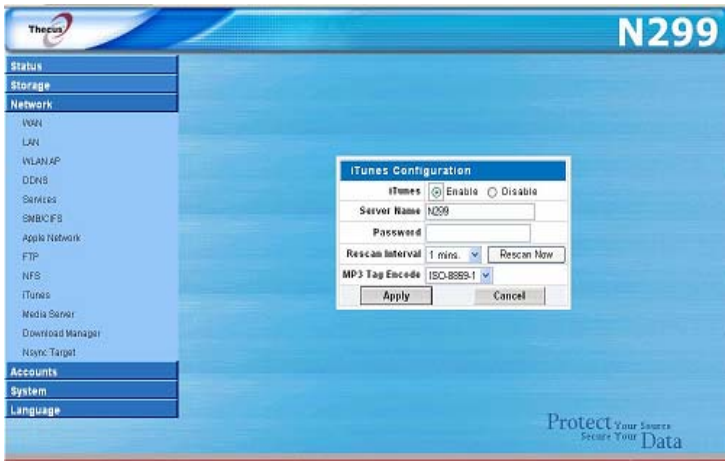
**NOTE** Anonymous users are not able to delete files on the N299. To delete files, users must login and be granted write access on the Access Control List.

To access the share folder on the N299, use the appropriate user login and password set up on the **Users** page (***Accounts*** > ***Users***). Access control to each share folder is set up on the **ACL** page (***Storage*** > ***Folder*** > ***ACL***).

When trying to access N299 anonymously, just enter "**anonymous**" as the user name.

## *iTunes® Server*

With the built-in iTunes server capability, the N299 enables digital music to be shared and played anywhere on the network!



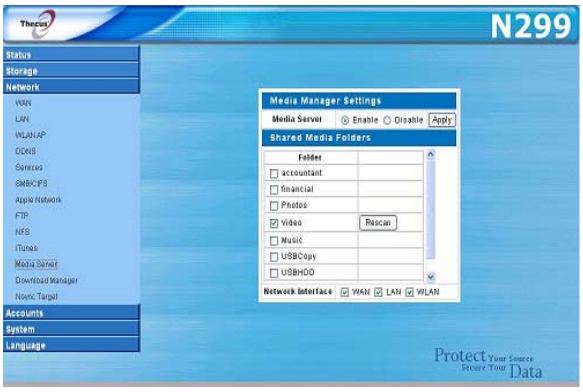

From the **Network** menu, choose the ***iTunes*** item, and the **iTunes Configuration** screen appears. You may enable or disable the iTunes Service from here. Once enabled, enter correct information for each field and press ***Apply*** to save your changes. See the following table for detailed descriptions of each field:

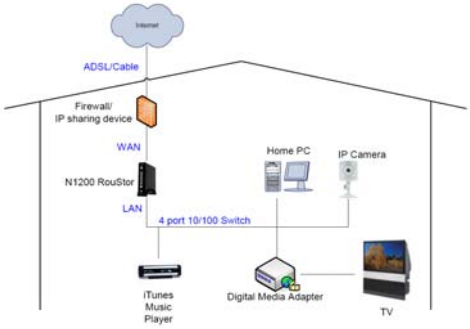
| **iTunes Configuration** | |
|---|---|
| **Item** | **Description** |
| iTunes | Enable or disable the iTunes Server. |
| Server Name | Name used to identify the N299 to iTunes clients. |
| Password | Enter password to control access to your iTunes music. |
| Rescan Interval | Rescan interval in seconds. You can click ***Rescan Now*** to rescan immediately. |
| MP3 Tag Encode | Specify tag encoding for MP3 files stored in N299. All ID3 tags will be send out in UTF-8 format. |

Once the iTunes service is enabled, the N299 will make all music located in the **Music** folder available for iTunes-equipped computers on the network.

## *Media Server*

With the built-in Media Server capability, the N299 provides media streaming service to stand-alone networked home media adapters that support the UPnP AV protocol. You can share digital media such as music, pictures, and movies with any compatible device throughout your entire home.



| Media Manager Settings | |
|---|---|
| **Item** | **Description** |
| Media Server | Enable or disable the Media Server service. Click |
| Shared Media Folders | Select the folder(s) that contains media files to be shared. By default, these include:<br>• Photos<br>• Video<br>• Music<br>• USBCopy<br>• USBHDD<br>• USDCam |
| Enabled on | With this setting, you can choose if the shared media folders are available via WAN, LAN, or WAN. Check the appropriate boxes to access your shared media folders through selected connections. |

## Adding Media Share Folders

Once the Media Server software is installed, you can start adding folders that contain the media that you would like to share. To create a media share folder, follow the steps below:

1. Click on ***Network*** > ***Media Server*** in the menu bar.

2. Select the folder that contains your media files, and click the checkbox.

3. The contents in the folder will be scanned for the Media Server. The time required for scanning depends on the size of the folder.

## Connecting DMAs to the Media Server

Next, it's time to connect your Digital Media Adapter (DMA) to the media server:

1. Connect your DMA to your Media Server

    a. Configure your DMA to use a Dynamic IP address. The IP address will be assigned by the router.
    b. Some DMAs are wireless enabled. You can connect the DMA to a wireless router. For instructions on how to connect your DMA to a wireless router, please refer to your DMA's user manual.

2. Connect your DMA's video output to video input of your TV set.

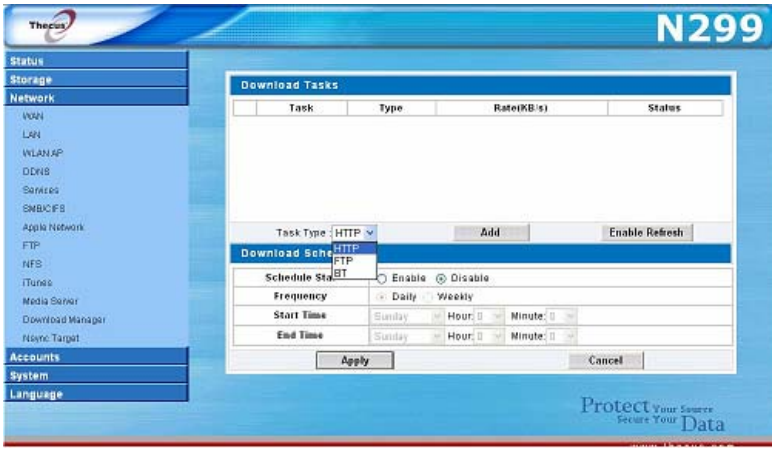
3. Turn on the TV and change the video signal input to DMA.

4. Setup the DMA (These steps will be different if you use a different DMA)

    a. From the Server List screen, select "**N299:Mediabolic Server**" as the server.
    b. Go to **My Media**
    c. Click on the **Up/Down Arrow** buttons to select **Music Jukebox**, **Photo Albums**, or **Video Clips**
    d. Start enjoying the contents stored in your N299.

## *Download Manager*

With the built-in Download Manager, you can have the N299 download HTTP, FTP, and BT files without having full PC powered on. What's more, you can even schedule your downloads for off-peak hours, ensuring efficient use of bandwidth.

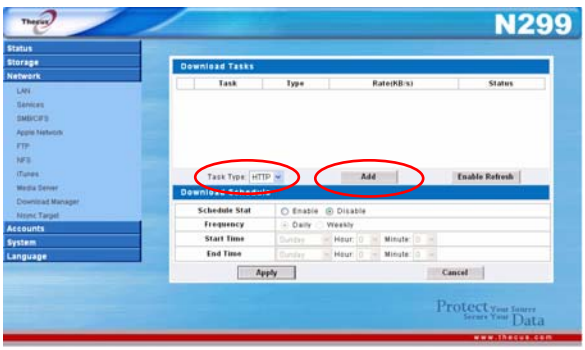



| Download Tasks | |
|---|---|
| **Item** | **Description** |
| ▶ | Click to start the specified task. |
| ⏸ | Click to pause the specified task. |
| ✖ | Click to delete the specified task. A prompt will appear asking you if you would like to delete the task itself, or the task and all related downloaded files. |
| Task | Name of the task. Click to see more information about this task. |
| Type | Type of transfer. Can read **HTTP**, **FTP**, or **BT**. |
| Rate | Transfer rate of the task in kilobytes per second (KB/s).<br>**DL:** Download rate<br>**UL:** Upload rate |
| Status | Status of the task.<br>**Complete:** Percentage complete (%)<br>**Completed / Total download size** |
| Task Type | Use this dropdown to select the type of transfer. **HTTP**, **FTP**, and **BT** are available. |
| Add Task | Click to add the kind of task specified beside "**Task Type**". |
| Enable Refresh | Click to refresh the task list. |

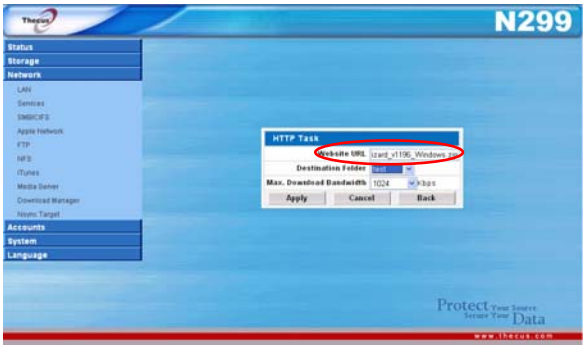
### Adding an HTTP Task

To add a new HTTP task to the Download Manager, follow these steps:

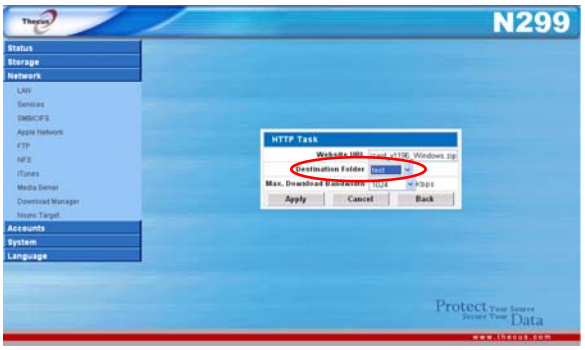
1. Using the **Task Type** dropdown, select ***HTTP*** and click ***Add***.



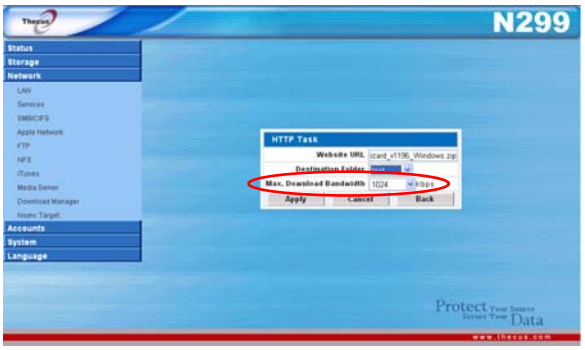

2. In the **HTTP Task** window, start by inputting the target URL in the **Website URL** box. This is the link to the download you want to queue.



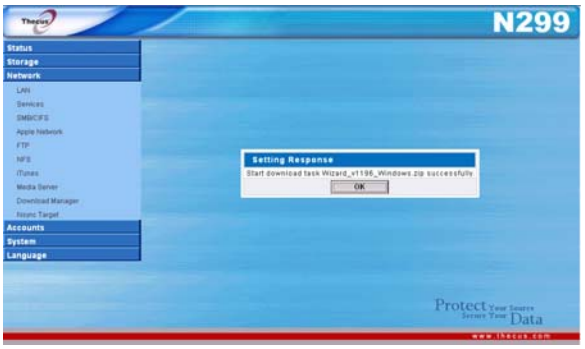

3. Next, select the destination folder from the **Destination Folder** dropdown. This is where the download will reside.



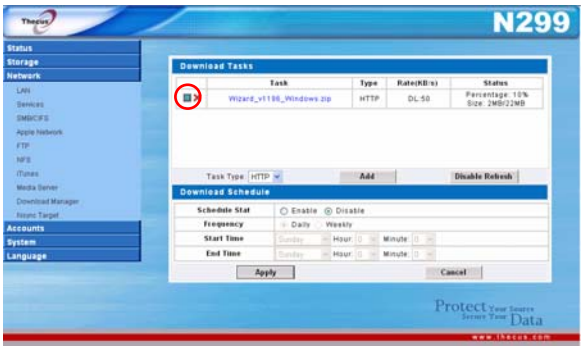

4. Select the maximum download bandwidth from the **Max. Download Bandwidth** dropdown.



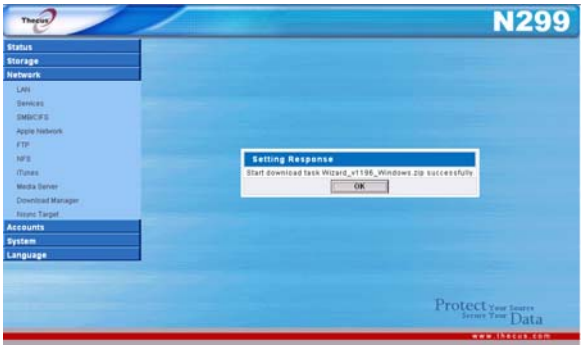

5. Press ***Apply*** to add the task.



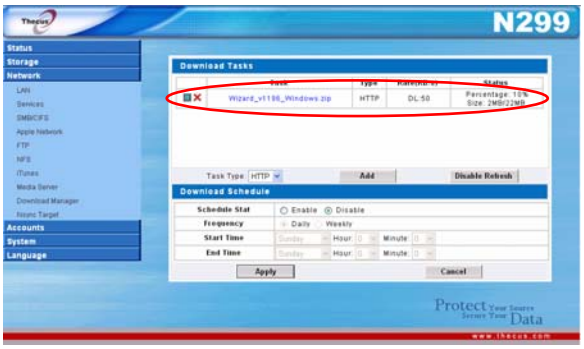
6. Once added, your download will appear in the list of download tasks. To start the download, simply click the **Start** icon (▶) and the download will begin.




7. The following prompt will be shown when the download begins:



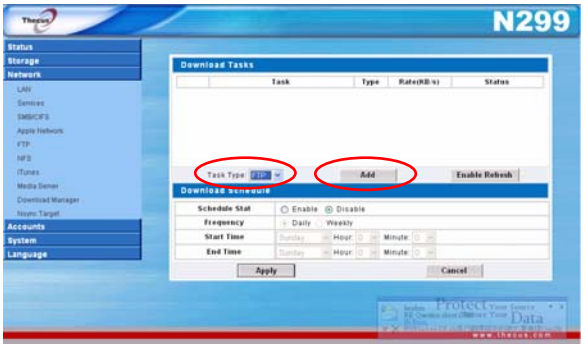

8. The download status will continually update in the **Download Tasks** window. To pause the download, click the **Pause** icon (⏸).



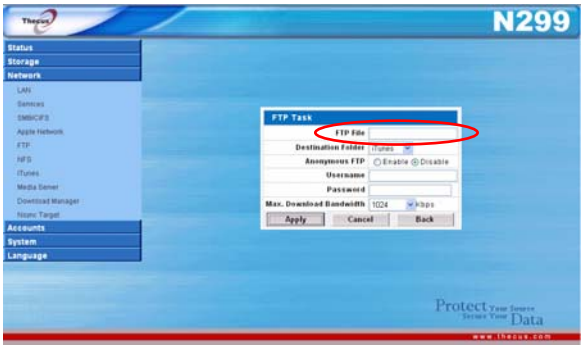

## Adding an FTP Task

To add a new FTP task to the Download Manager, follow these steps:

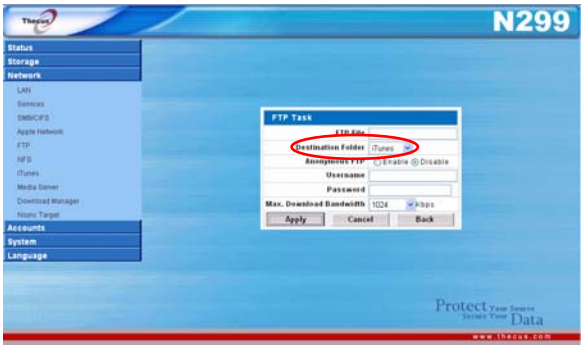
1. Using the **Task Type** dropdown, select ***FTP*** and click ***Add***.



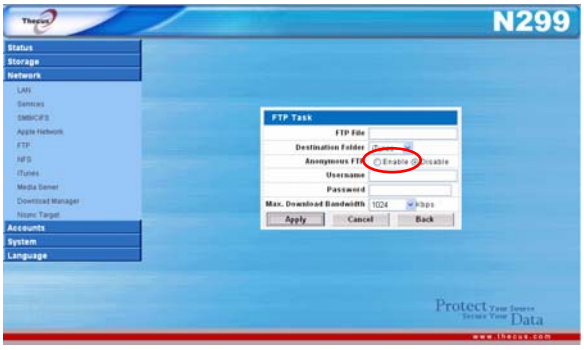

2. In the **FTP Task** window, start by inputting the target URL in the **FTP File** box. This is the link to the download you want to queue.



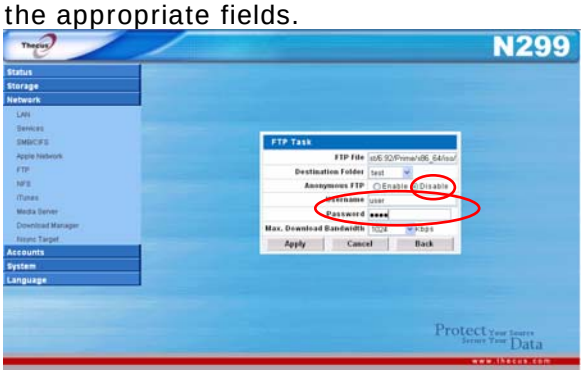

3. Next, select the destination folder from the **Destination Folder** dropdown. This is where the download will reside.



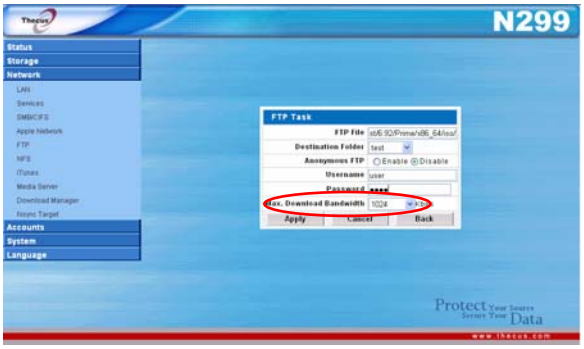

4. The next step depends if you are using an anonymous login for your FTP download. If you are logging in anonymously, select ***Enable*** and move on to step 5.



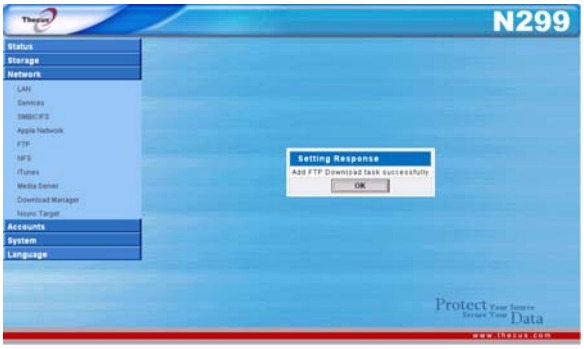
If you are required to login with a user name and password, set **Anonymous FTP** to ***Disable*** and input your user name and password into the appropriate fields.



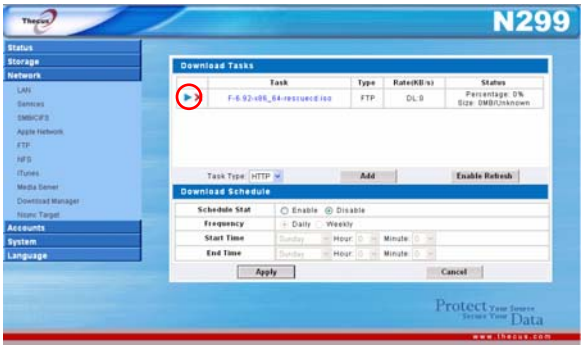

5. Select the maximum download bandwidth from the **Max. Download Bandwidth** dropdown.



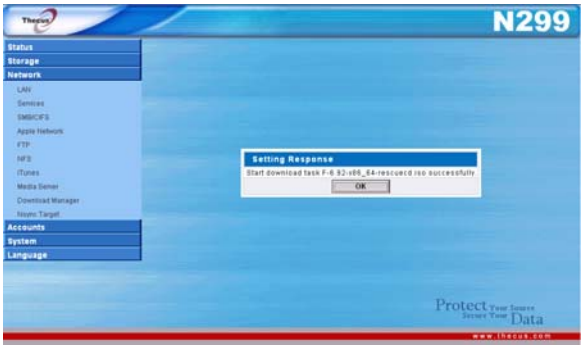

6. Press ***Apply*** to add the task.



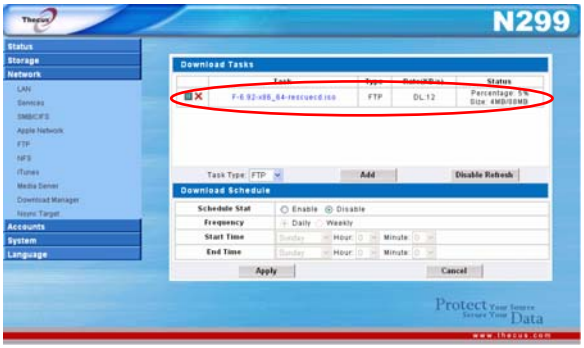

7. Once added, your download will appear in the list of download tasks. To start the download, simply click the **Start** icon (▶) and the download will begin.



8. The following prompt will be shown when the download begins:



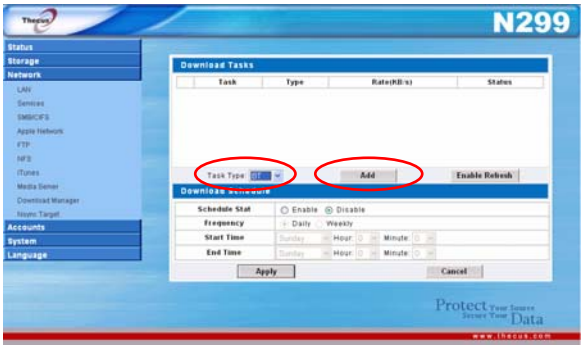

9. The download status will continually update in the **Download Tasks** window. To pause the download, click the **Pause** icon ( ).



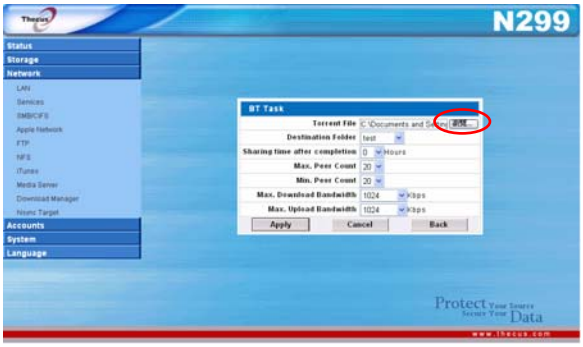

## Adding a BT Task

To add a new BT task to the Download Manager, follow these steps:

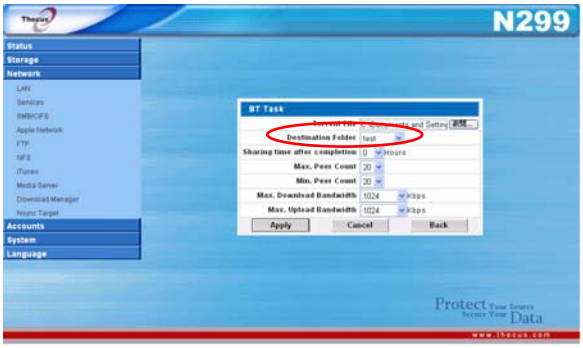
1. Using the **Task Type** dropdown, select ***BT*** and click ***Add***.



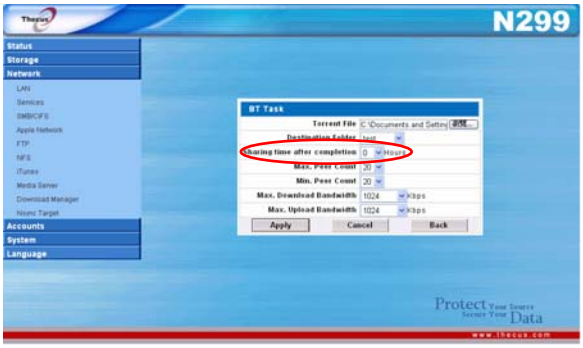

2. In the **BT Task** window, start by clicking ***Browse…*** and selecting the torrent file you wish to start.



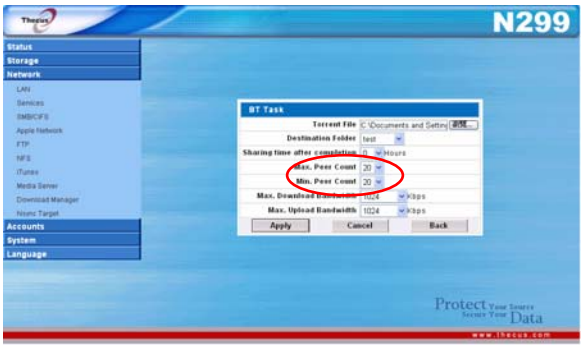

3. Next, select the destination folder from the **Destination Folder** dropdown. This is where the download will reside.



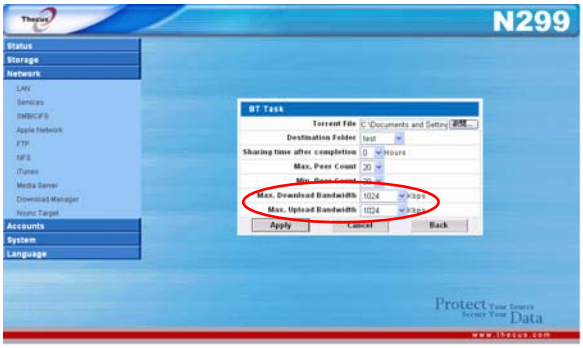

4. Next, you can designate the **Sharing time after completion** by selecting the number of hours from the dropdown.




5. Next, you can select the maximum and minimum number of peers from selecting the counts from the appropriate dropdowns.

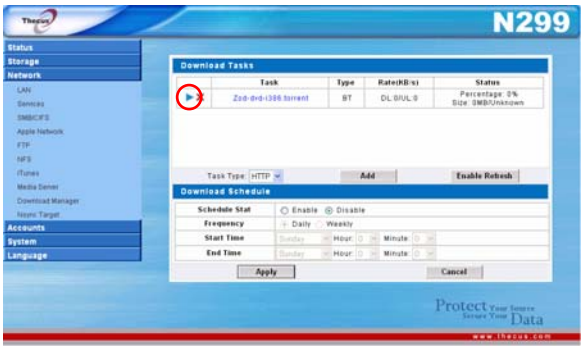



6. Next, you can set the maximum download and upload bandwidths from the dropdowns below.

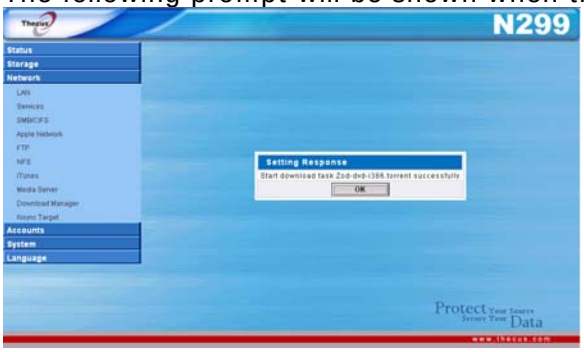



7. Press ***Apply*** to add the task.

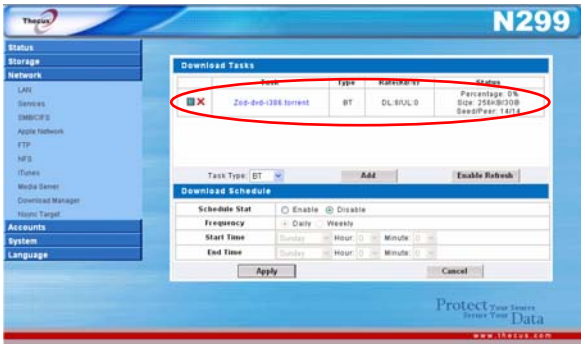
8. Once added, your download will appear in the list of download tasks. To start the download, simply click the **Start** icon (▶) and the download will begin.




9. The following prompt will be shown when the download begins:




10. The download status will continually update in the Download Tasks window. To pause the download, click the **Pause** icon (⏸).




## Deleting Tasks

To delete a task, simply follow the steps below:

1. Click the delete icon (✕) beside the task that you wish to delete. The **Delete Task** dialogue box will appear.

2. Select ***Delete Task only*** if you wish to remove only the torrent file and all transient files, leaving the unfinished download files intact.

3. Select ***Delete Task and Files*** if you wish to remove the torrent file and all transient files, and the unfinished download files.

4. Click ***OK*** to delete the task. Click ***Cancel*** to return to the **Download Manager**.

## Scheduling Downloads

You can schedule your downloads to begin at different times of the day. This is useful if you wish to complete your downloads during off-peak hours, reserving your bandwidth for other applications. A table describing the **Download Schedule** window appears below:

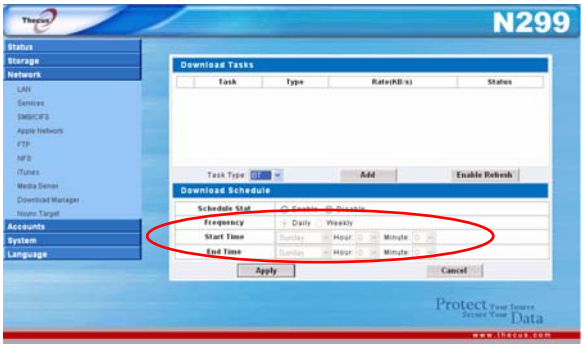
| **Download Schedule** | |
|---|---|
| **Item** | **Description** |
| Schedule Stat | Enable or disable the Download Scheduler. |
| Frequency | Choose to have the Download Scheduler activate on a daily or weekly basis. |
| Start Time | Specify the start day/hour/minute for the download task. |
| End Time | Specify the end day/hour/minute for the download task. |

To schedule downloads, follow these steps:

1. Under **Download Schedule**, set **Scheduler** to ***Enable***.

2. To schedule a daily download period, select ***Daily*** and select a start time and end time.

   To schedule a weekly download period, select ***Weekly*** and select a start day/time and end time/day.




3. Click ***Apply*** to save your changes.

**NOTE** If the Download Scheduler is enabled, ALL download tasks will adhere to the designated schedule.

## *Printer Server*

You can configure the N299 to act as a printer server. That way, all PCs connected to the network can utilize the same printer. From the **Status** menu, choose the Printer item, and the **Printer information** screen appears. To setup in either Windows XP or Vista, please refer the following for steps.

### Windows XP SP2

1. Connect the USB printer to one of the USB ports (preferably the rear USB ports; front USB ports can be used for external HDD enclosures).
2. Go to ***Start*** > ***Printers and Faxes***.
3. Click on **File** > **Add Printer**.
4. The **Add Printer Wizard** appears on your screen. Click ***Next***.
5. Select the "***A network printer, or a printer attached to another computer***" option.

6. Select "***Connect to a printer on the Internet or on a home or office network***", and enter "**`http://N299_IP_ADDRESS:631/printers/usb-printer`**" into the URL field.

7. Your Windows system will ask you to install drivers for your printer. Select correct driver for your printer.

8. Your Windows system will ask you if you want to set this printer as "Default Printer". Select ***Yes*** and all your print jobs will be submitted to this printer by default. Click ***Next***.

9. Click ***Finish***.

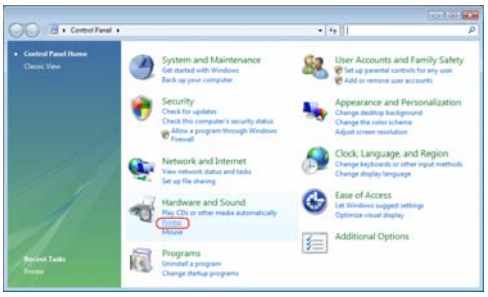
**NOTE**

- *Not all USB printers are supported. Please check Thecus website for a list of supported printers.*
- *Note that if a multi-function (all-in-one) printer is attached to the N299, usually only the printing and fax functions will work. Other features, such as scanning, probably will not function.*

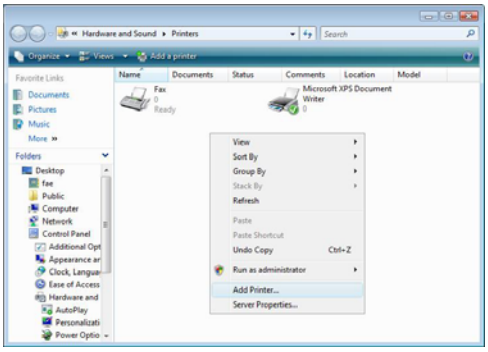
## Windows Vista

To set up the Printer Server in Windows Vista, follow the steps below:

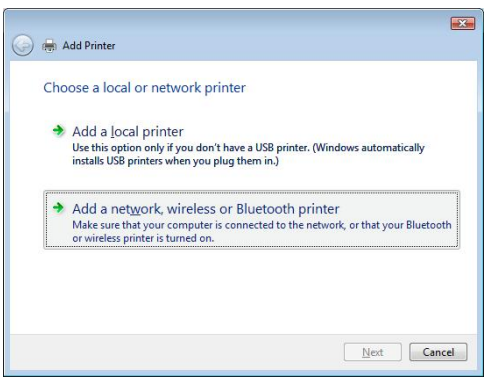
1. Open ***Printer Folder*** from the **Control Panel**.



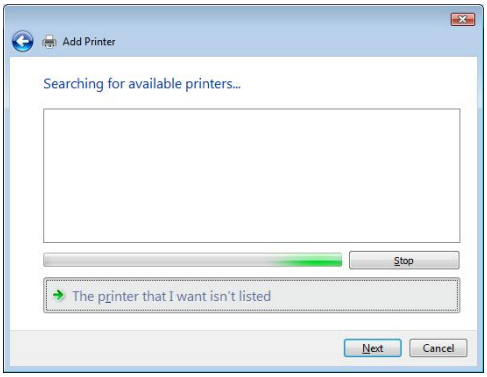

2. Click the right mouse button in anywhere on the **Printers** folder and then select ***Add Printer***.




3. Select ***Add a network, wireless or Bluetooth printer***.

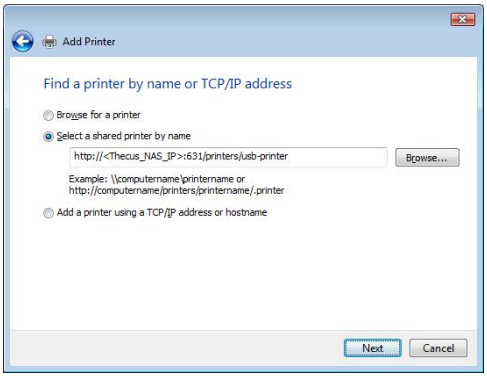

Add Printer
Choose a local or network printer
Add a local printer
Use this option only if you don't have a USB printer. (Windows automatically installs USB printers when you plug them in.)
Add a network, wireless or Bluetooth printer
Make sure that your computer is connected to the network, or that your Bluetooth or wireless printer is turned on.
Next
Cancel

4. Select ***The printer that I want isn't listed***.



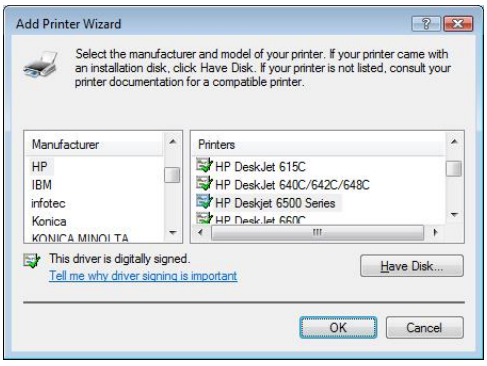

You can press ***The printer that I want isn't listed*** to go into next page without waiting for **Searching for available printers** to finish.

5. Click ***Select a shared printer by name***.



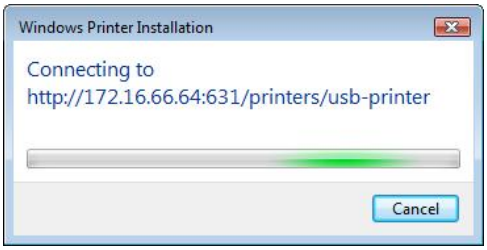

Type `http://<Thecus_NAS>:631/printers/usb-printer` in the box, where <Thecus_NAS_IP> is the IP address of the N299. Click ***Next***.

6. Select or install a printer and then press ***OK***.

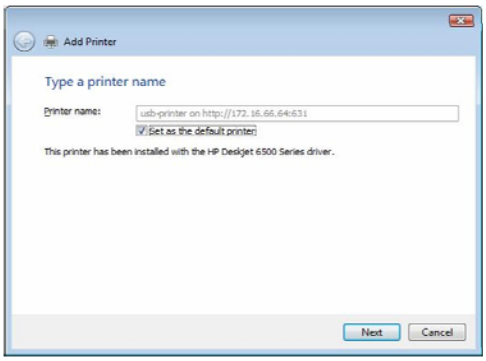

Add Printer Wizard
Select the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.
Manufacturer
HP
IBM
infotec
Konica
Printers
HP DeskJet 615C
HP DeskJet 640C/642C/648C
HP Deskjet 6500 Series
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
OK
Cancel

If your printer model is not listed, please contact your printer manufacturer for help.

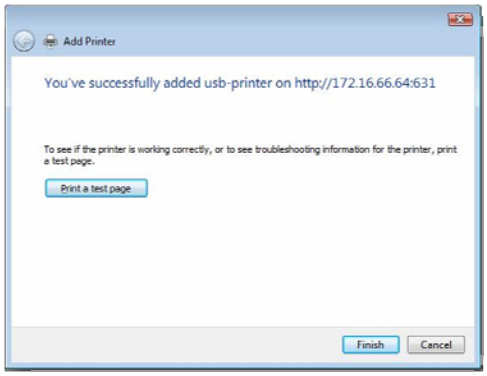
7. Windows will attempt to connect to the printer.




8. You can choose to set this printer as the default printer by checking the ***Set as the default printer*** box. Click ***Next*** to continue.

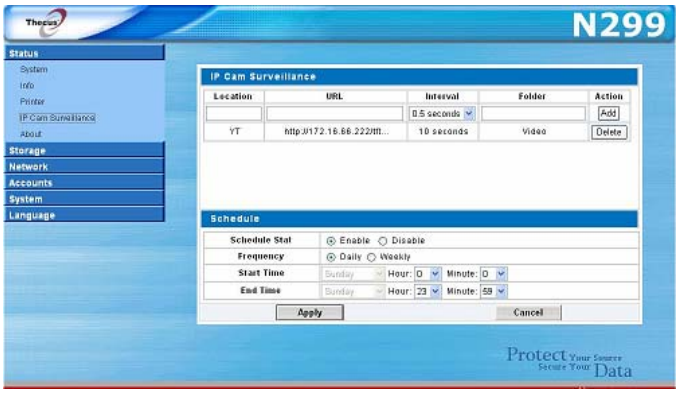



9. Done! Click ***Finish***.


Add Printer
You've successfully added usb-printer on http://172.16.66.64:631
To see if the printer is working correctly, or to see troubleshooting information for the printer, print a test page.
Print a test page
Finish
Cancel

## *IP Cam Surveillance*

With the Simple Surveillance Server, you can connect an IP cam to the N299 to capture images. The Simple Surveillance Server also supports scheduling, which means that you can configure the N299 to perform home surveillance at any time.




From the **Status** menu, choose the ***IP Cam Surveillance*** item, and the

**IP Cam Surveillance Information** screen appears. The IP Cam screen provides information and allows you to configure the Simple Surveillance Server.

| IP Camera | |
|---|---|
| **Item** | **Description** |
| Location | Specify the location where the IP Cam located. |
| URL | Input the URL address to capture the image. |
| Interval | Designates the interval for each captured frame. |
| Folder | Input where the images will reside. |
| Action | Click ***ADD*** to add the task, ***Delete*** to remove task. |
| Apply | Click ***Apply*** to save changes. |
| Cancel | Click ***Cancel*** to abandon changes. |

To designate a schedule for the Simple Surveillance Server, click Schedule, and the Schedule Configuration window will appear:

| Schedule Configuration | |
|---|---|
| **Item** | **Description** |
| Schedule Start | Checked on enable to activate image capture. |
| Frequency | Frequency of the schedule. Select from **Daily** and **Weekly** |
| Start Time | Scheduled time for image capture to begin. |
| End Time | Scheduled time for image capture to finish. |
| Apply | Click ***Apply*** to save changes. |
| Cancel | Click ***Cancel*** to abandon changes. |

## IP Cam Configuration

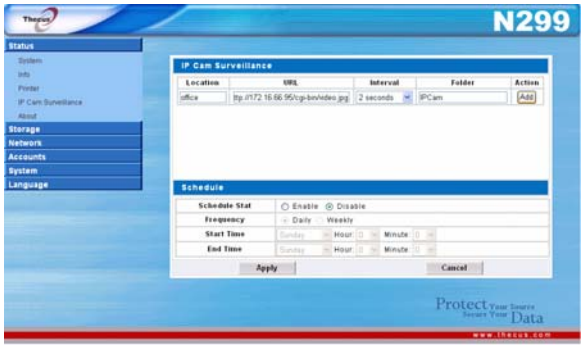
Setting up an IP Cam for use with the N299 is easy. In this example, we'll setup a Vivotek PT7237 IP cam for use with the N299. Configuring a different IP cam will be slightly different depending on the model you are using, but this guide will outline the basics.

Follow the instructions included with your IP cam for installation. Once your IP cam is properly installed, follow the steps below to configure your N299.

### *Step 1: Connect the IP Cam to the N299*

The first step is to connect your IP cam to the N299. To do this, login to the N299's Web Admin Interface and select **IP Cam Surveillance** from the menu. The **IP Cam Surveillance** window will appear. Here, we will connect your installed IP Cam to the N299.

In this window, you will be asked to fill in some basic information about your IP camera. Let's go through each field in order:




**Location**: Here, you can designate a location that the IP cam is located. For example, if the IP cam is currently monitoring your office, you can enter "office" in the blank. Choose a name that is meaningful will make it easier to refer back in the future.

**URL**: This is where the URL for your IP cam is entered. Every IP cam has a URL that is provided which links to a landing page for all captured images. In this example, the Vivotek PT7237 uses the following URL:

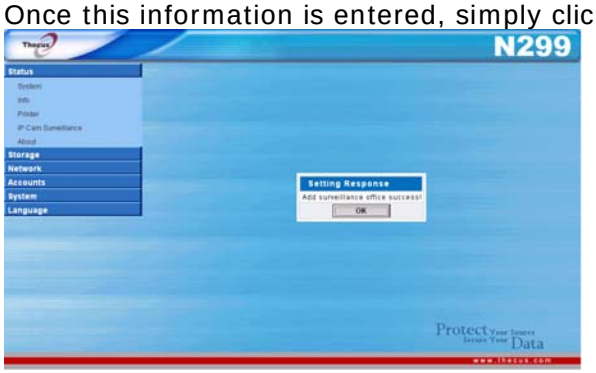
`http://172.16.66.95/cgi-bin/video.jpg`

Please refer to your IP cam manual for the appropriate URL to enter into this field.

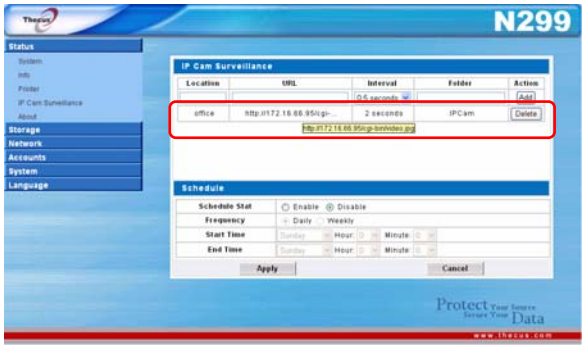
**Interval**: Here, you can designate the time between each captured image. Select the desired interval from the dropdown menu.

**Folder**: Enter the name of the folder you wish the N299 to store captured images to.

Once this information is entered, simply click ***Add***.

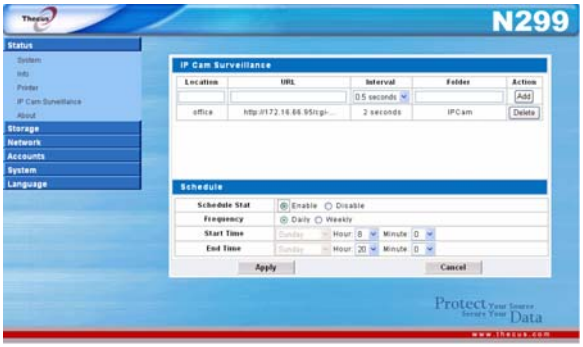



After clicking ***OK*** to the resulting prompt, your IP cam will appear in the **IP Cam Surveillance** window.




## *Step 2: Designate a Capture Schedule*

Once connected, the next step is to create a capture schedule for your IP cam. To do this, enter the correct information into the **Schedule** window.




Let's take a closer look at each field:

**Schedule Stat**: To enable the scheduling function, click ***Enable***.

**NOTE** If the scheduling function is set to **Disable**, images from any connected IP cameras will not be saved onto the N299.

**Frequency**: Here, you can set the frequence of the schedule to either **Daily** or **Weekly**. When set to Daily, images will be captured every day at the designated time. When set to Weekly, you can have the IP camera capture images at certain days of the week (i.e Monday to Friday).

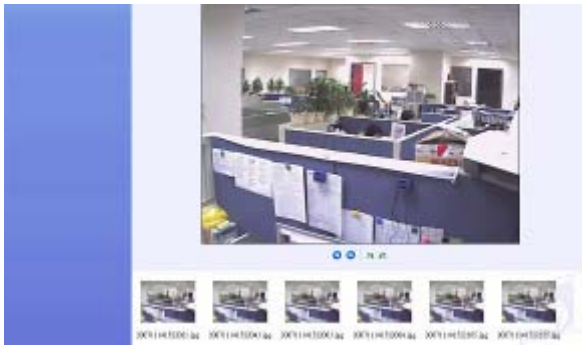
**Start Time**: Choose the start day and time for image capture. If you've selected a **Daily** frequency, you will be unable to select the start day as the IP camera will be set to capture images every day.

**End Time**: Chosse the end day and time for image capture. If you've selected a Daily frequency, you will be unable to select the end day as the IP camera will be set to capture images every day.

Once you are finished, click ***Apply*** to enable your new schedule.

### *Step 3: Browse Captured Images*

Once the capture schedule has been set, you can browse the captured images on the N299. The easiest way to do this is to simply open the folder you previously designated as the capture directory and view your captured pictures using your favorite photo viewing software. In the example above, all captured images will appear in the **IPCam** folder.



Alternatively, you may also use the built-in web-based Photo Gallery to view your pictures. For information on how to set up the Photo Gallery, check here.

# Chapter 5: Using the N299

## *Overview*

Once the N299 is setup and operating, users on the network may manage all varieties of digital music, photos, or files by simply using their web browsers. To manage your personal files or access public files on the N299, just enter its IP address into your browser, and you will be taken to the **N299 Login** page.

## *Login Page*

On the login page, simply enter your **User ID** and **Password** and click ***Login*** to log into the system.

Once logged in, you will be seen the icons for **WebDisk** where you can see the directories and files stored on the N299.

## *Using WebDisk*

1. From the WebDisk folder list, users will see all public folders and all folders which they have sufficient access rights.

| **WebDisk Folder List** | |
|---|---|
| **Item** | **Description** |
| Name | Name of folder |
| Comments | Comments about folder |
| Change Password | Click to change your password |
| Logout | Click to logout of the WebDisk |

2. When they click on the name of a folder, they will be brought to the Folder Screen, where they will see the files within that folder.

| **WebDisk Folder Screen** | |
|---|---|
| **Item** | **Description** |
| Name | Name of folder |
| Type | File type |
| Size | Size of file |

| | |
|---|---|
| Modified Date | Date file was last modified |
| Change Password | Click to change your password |
| Logout | Click to logout of WebDisk |
| Up | Click to go up one directory level |
| New Folder | Click to create a new folder |
| New File (upload) | Click to upload a new file to this folder |
| Delete Selected Items | Click to delete all checked items |

3. When user clicks on a file name, the file will be downloaded.

**NOTE** The Delete Selected Items, New Folder, and New File (upload) options are only visible if the user has write access to the specific folder.

For more information on how to setup user rights to the folders, please check ***Chapter 3: System Management > Storage Management > Folder Management > Folder Access Control List (ACL)***

To access folders with access control, you must first login with a local user account.

## *Using iTunes® Server*

The N299 has a built-in iTunes® Server that allows you to stream music stored on the N299 to any iTunes-ready device on your network.

You can use the WebDisk function to manage your digital music, or you can manage through SMB/CIFS (see SMB/CIFS Setup section).

### Adding Music Files

You could add music files into iTunes Server through Web User Interface; however, if you have lots of folders and files to upload, there is a simpler way.

1. Open a Windows Explorer and type the N299 IP address in the address bar (i.e. `\\192.168.1.100`).

2. Double click the ***Music*** folder to enter it. Then drag and drop music folders and files here.

3. The N299 iTunes server will take some time to cache the ID3 tag of every file. Once the process is done, you will see all the music files from iTunes clients.

### Playing Music Files

Once your music files are added to the N299, playing them on any iTunes-equipped computer connected to the network is easy:

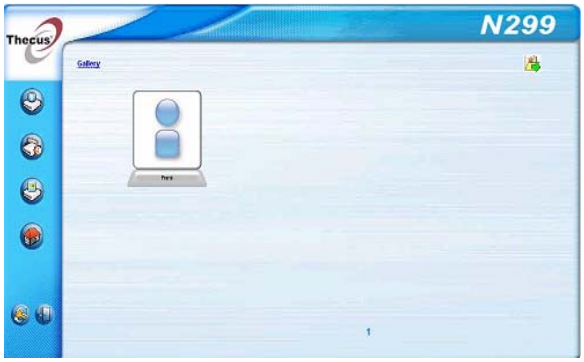
1. Open iTunes.

2. You should see **Thecus_N299** under the **SHARED** heading in the left hand menu.

3. Click **Thecus_N299** and all shared music will be displayed, ready to be enjoyed right from iTunes.

## *Using Photo Gallery*

Using the Photo Gallery, users can view and share photos, and even create their own albums right on the N299. To manage your photo gallery or see other photo albums, click on the ***Photos*** icon from the left panel.




You will see your own Photo Gallery and all public Photo Albums on the network.
To manage any picture files, you must first select the item by clicking its check box.

### Managing Albums and Photos

| Photo | | |
|---|---|---|
| **Icon** | **Function** | **Description** |
| | Make Cover | Make selected photo your cover picture. |
| | Add | Add a new album or photos. |
| | Edit | Edit the name and description of the selected album or photo. Each name is limited to 20 characters and each description is limited to 255 characters. |
| | Delete | Delete the selected albums or photos. |

**NOTE**

- *Only logged in users will see these icons.*
- *To prevent system errors, the N299 sets the following limitations on photo files:*
  - *Each file upload is limited to a size of 4MB. Files exceeding 4MB will NOT be uploaded and no error message will appear.*
  - *Only these photo file types will be uploaded: *.jpg, *.gif, *.bmp, *.png, *.pcx, *.psd, *.bmp.*
  - *If duplicate file names exist during upload process, system will add a number in front of the original file name (abc ( 1abc).*

### Creating Albums

To create a photo album, follow the steps below:

1. Click the ***Add*** button to create a new album.

2. Enter a name for the album, and enter a description if you wish. Then, click on the ***Create Album*** button.

### Password Protecting Albums

If you would like to put a password on a particular album, follow these steps:

1. Select the album to be protected, click on the ***Edit*** button, and the **Album Edit** screen will appear.

2. The owner of the album can enter an album password to protect the album, so that only people with the correct password can view the album.

## Uploading Pictures to Albums

Uploading pictures to albums using the Web User Interface is easy:

1. When the album is created, click the album icon to enter the album. Initially the album is empty.

2. Click the ***Add*** button to upload pictures into the album. The **Upload Photos** screen will appear. Users can select and upload up to 8 pictures at a time.

3. Once the picture is uploaded, you can view it in the album.

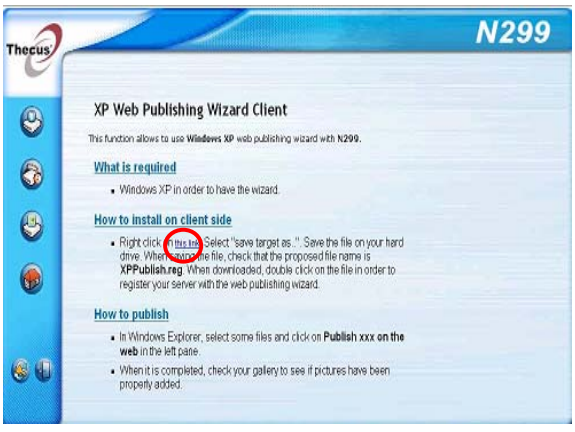
4. The owner of the album can delete or modify the pictures with the ***Delete*** or ***Modify*** buttons on the top right hand corner.

## Windows XP Publishing Wizard

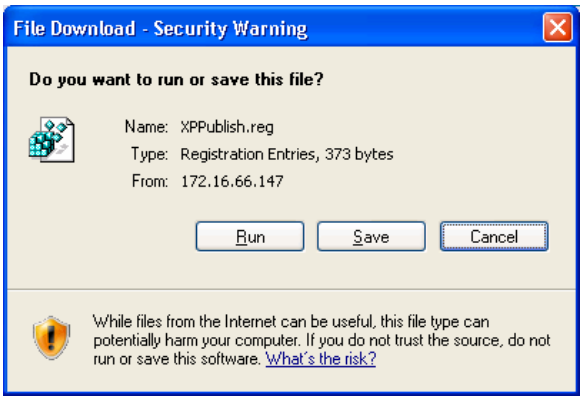
There are many ways for a local user to upload pictures into their photo album. Users of Windows XP can upload their pictures using the Windows XP Publishing Wizard.

1. Click on the ***XP Publishing Wizard*** icon.

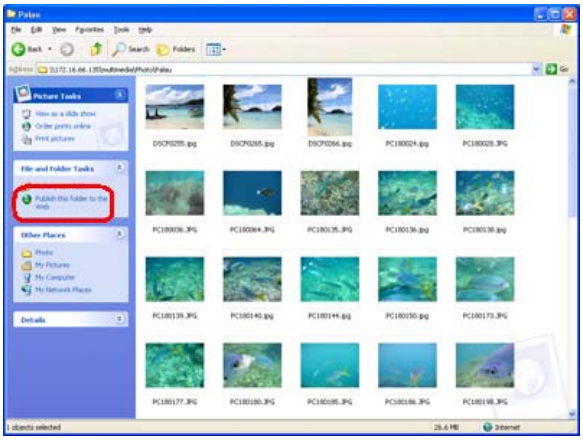
2. The **XP Web Publishing Wizard Client** screen appears. Click on the link to install the Publishing Wizard.


Thecus
N299
XP Web Publishing Wizard Client
This function allows to use Windows XP web publishing wizard with N299.
What is required
Windows XP in order to have the wizard.
How to install on client side
Right click on this link. Select "save target as..". Save the file on your hard drive. When saving the file, check that the proposed file name is XPPublish.reg. When downloaded, double click on the file in order to register your server with the web publishing wizard.
How to publish
In Windows Explorer, select some files and click on Publish xxx on the web in the left pane.
When it is completed, check your gallery to see if pictures have been properly added.

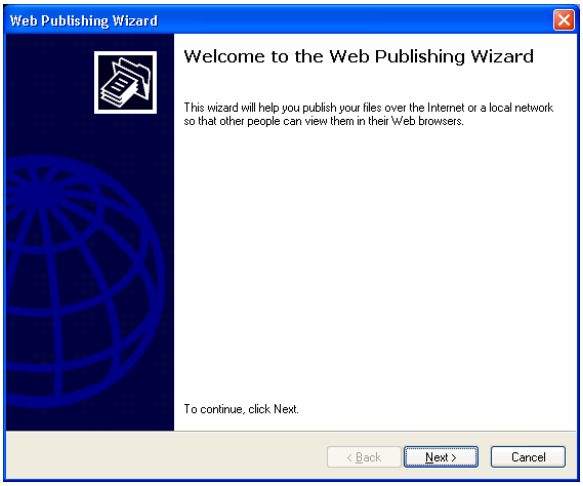
3. Windows XP will ask whether you want to run or save this file. Click ***Run***.


File Download - Security Warning
Do you want to run or save this file?
Name: XPPublish.reg
Type: Registration Entries, 373 bytes
From: 172.16.66.147
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?

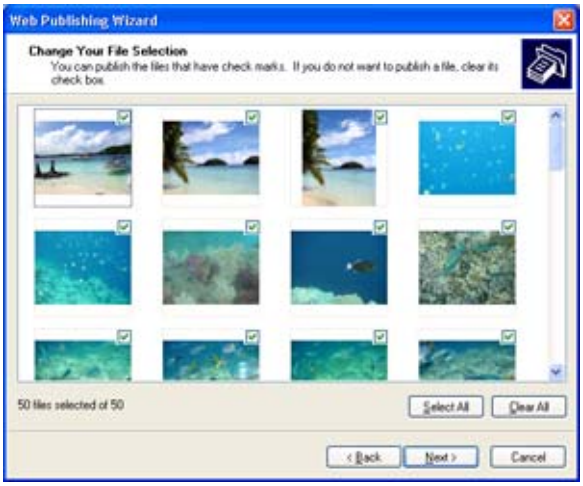
4. Once the Wizard is installed, use the Windows file manager to browse the folder that contains the picture you want to publish. On the left pane, there will be an icon labeled "**Publish this folder to the Web**".



5. Click on this icon and **Web Publishing Wizard** will start.

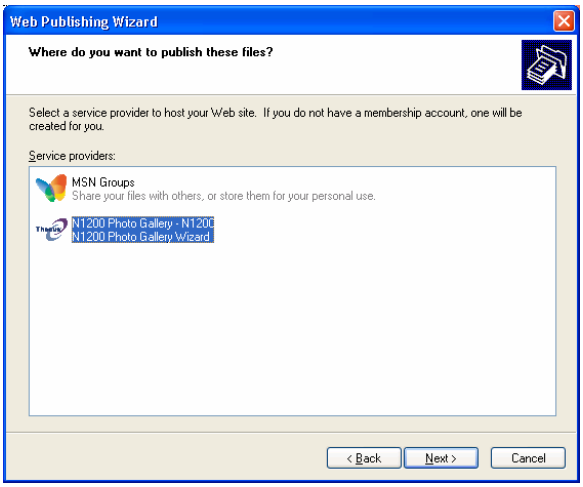

Web Publishing Wizard
Welcome to the Web Publishing Wizard
This wizard will help you publish your files over the Internet or a local network so that other people can view them in their Web browsers.
To continue, click Next.
< Back
Next >
Cancel

6. Select the pictures you want to publish to the Photo Web Server by placing a check mark on the top left hand corner of the picture. Click ***Next***.

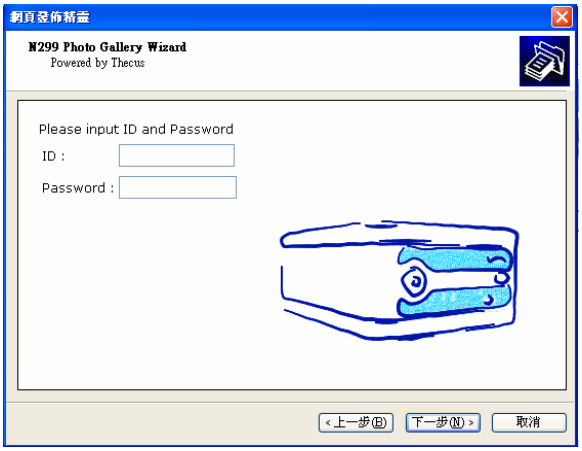

Web Publishing Wizard
Change Your File Selection
You can publish the files that have check marks. If you do not want to publish a file, clear its check box.
50 files selected of 50
Select All
Clear All
< Back
Next >
Cancel

7. Your PC will start to connect to the Photo Web Server.

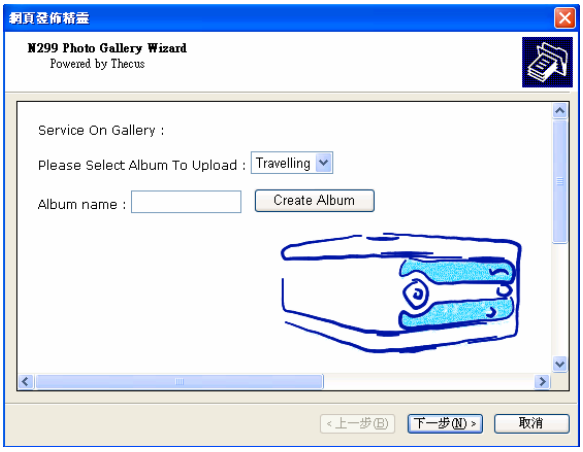
8. Select **N299 Photo Gallery Wizard** to publish your pictures to the N299.


Web Publishing Wizard
Where do you want to publish these files?
Select a service provider to host your Web site. If you do not have a membership account, one will be created for you.
Service providers:
MSN Groups
Share your files with others, or store them for your personal use.
N1200 Photo Gallery - N1200
N1200 Photo Gallery Wizard
< Back
Next >
Cancel

9. Login into the N299 with your local user name and password.

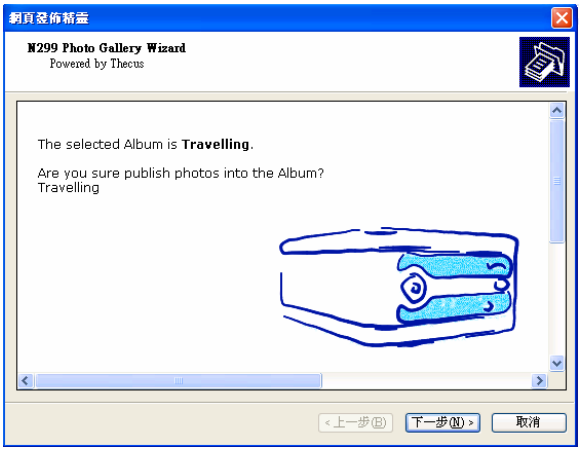



10. Create your album by entering an album name and clicking on the **Create Album** button.

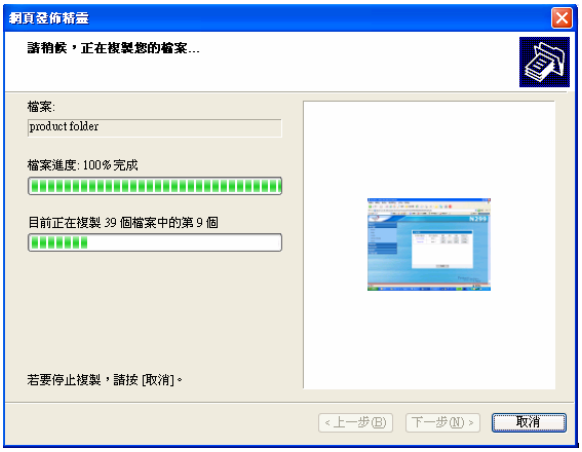



11. Select the album you want to upload your pictures to.

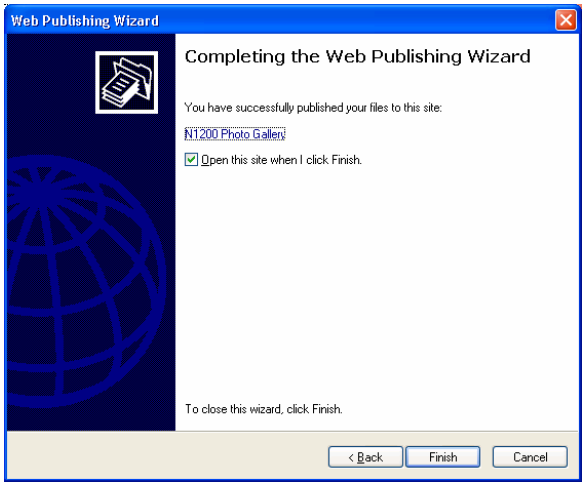
12. Confirm the target album.



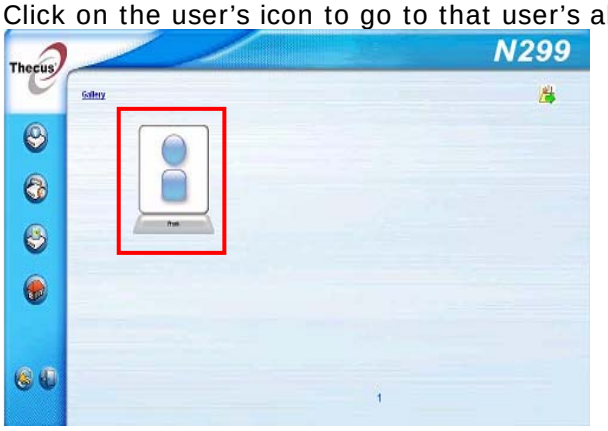

13. Windows will show you that the picture upload is in progress.



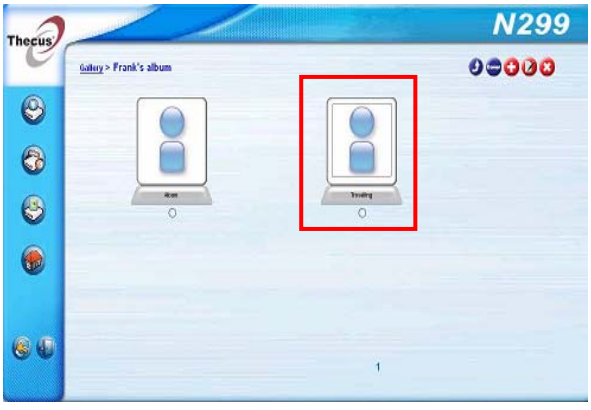

14. When the upload is finished, the Wizard will ask you whether if you want to go to the website. Click ***Finish*** to go to your Photo Web Server.


Web Publishing Wizard
Completing the Web Publishing Wizard
You have successfully published your files to this site:
N1200 Photo Gallery
Open this site when I click Finish.
To close this wizard, click Finish.
< Back
Finish
Cancel

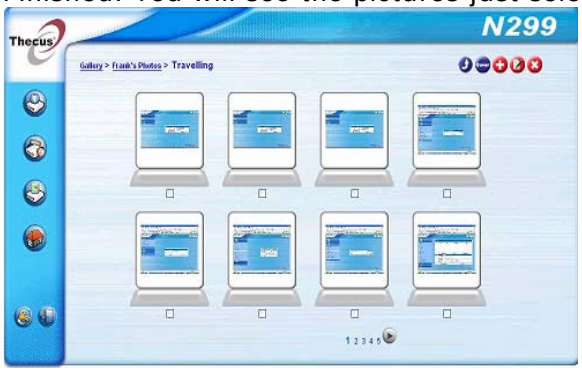
15. Click on the user's icon to go to that user's album.




16. You will see the user's album list. Click on **MyAlbum**.




17. Finished! You will see the pictures just selected in the album.



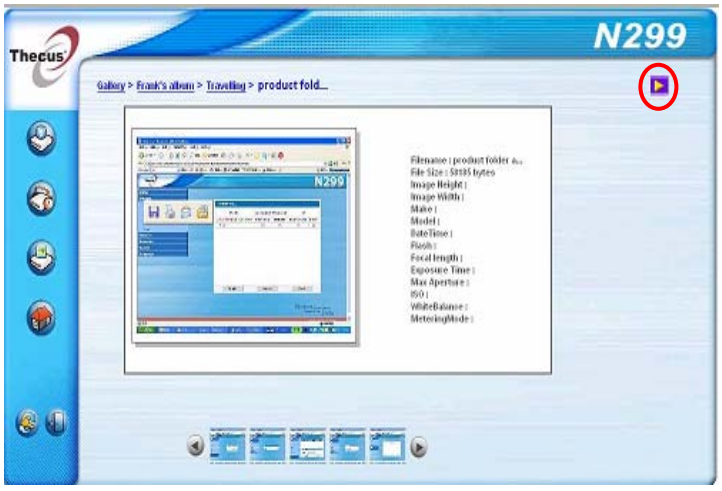
## EXIF Information

While viewing pictures, you can also have the N299 display the EXIF information for each photo.

## Slide Shows

Slide shows are a great way to enjoy pictures stored on your N299.

You can click on the ***Start Slide Show*** icon on the top right hand corner to start the slide show.

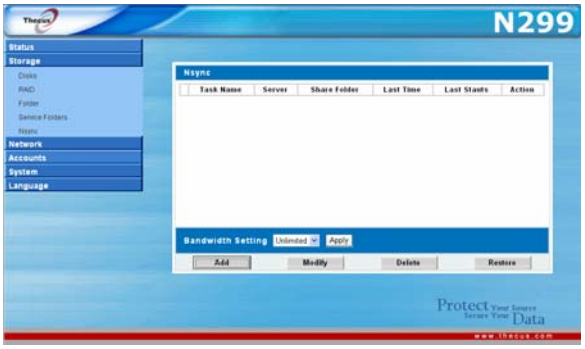



To stop the slide show, click on the ***Stop Slide Show*** icon on the top right hand corner.

## *File Backup*

There are a number of ways to back up your data to your N299.

### Nsync




You can backup a share folder to another N299 (Nsync Target) or any FTP server for safe keeping as long as you have appropriate access right on that target. When using Nsync between two N299s, you have the option to transmit files securely between two N299s.

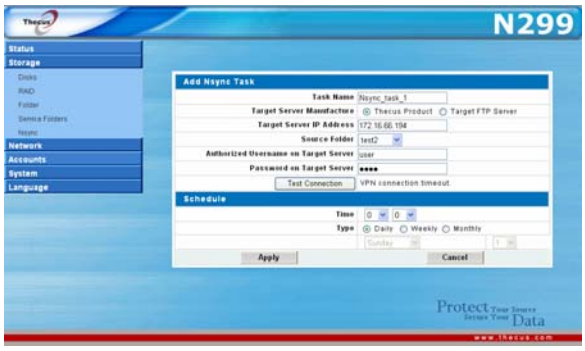
If the files on your N299 are lost for any reason, you can restore those files from the target N299. To backup files regularly, you can set up a scheduled task to run only once, daily, weekly, or monthly. You can also limit the bandwidth of your Nsync tasks, so other users on the network can share the bandwidth equally.

Under the **Storage** menu, click ***Nsync*** and the **Nsync** window appears. Below is a description of each field:

| **Nsync** | |
|---|---|
| **Item** | **Description** |
| Task name | The name of your Nsync task. |
| Server | The IP address of your target server |
| Share folder | The share folder you would want to backup. |
| Last Time | The time when the last Nsync task was executed. |
| Last Status | The status of your last Nsync task. |
| Action | Administrator can run or stop an Nsync task by pressing the action button. |
| Bandwidth Setting | Bandwidth control on Nsync tasks. |
| Add | Click to add a Nsync task |
| Modify | Click to modify an Nsync task. |
| Restore | Restore share folder from an Nsync target. |
| Delete | Click to delete an Nsync task. Backup files on Nsync target is also deleted. |

### *Adding an Nsync Task*

From the **Nsync Information** screen, click ***Add*** to display the **Add Nsync Task** screen.




| Add Nsync Task | |
|---|---|
| **Item** | **Description** |
| Task Name | The name of your Nsync task. |
| Manufacturer | Select whether the target is a Thecus Product (e.g. N299) or FTP server. |
| Target Server IP Address | The IP address of your target server. |
| Source Folder | The share folder you want to backup. |
| Nsync Task Name | The name of your Nsync task. |
| Authorized Username on Target Server | The account name on the target server. |
| Password on Target Server | The password for the username on the target server. |
| Test Connection | Click to check the connection to the Target Server. |
| Schedule | Schedule backup of your share folders. |
| Time | The time when the Nsync task will run. |
| Type | Select whether to run the Nsync task daily, weekly, or monthly.<br>**Daily**: input the time of day to execute Nsync task.<br>**Weekly**: input which day of the week to execute the task.<br>**Monthly**: decide which day of the month to execute the task. |
| Apply | Click to submit the task. |

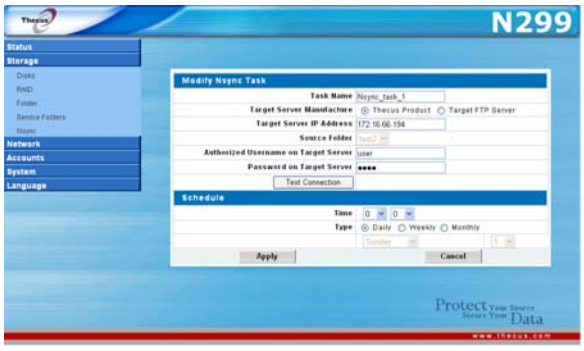
**NOTE** Before starting an Nsync Task, make sure the target server's Nsync Server (or FTP Server) is enabled.

### *Modifiying an Nsync Task*

1. On the Nsync window, select the Nsync task you would like to modify by checking its checkbox. Click ***Modify*** and the **Modify Nsync Task** window appears.

2. Change the settings for your Nsync task.

3. Click ***Apply*** to save your settings.




### *Deleting an Nsync Task*

1. On the Nsync window, select the Nsync task you would like to delete by checking its checkbox.

2. Click ***Delete*** to remove the selected Nsync task.

### *Setting Up an Nsync Target on an Nsync Device*

On the Nsync target server, the administrator of that server has to set up a user account with a folder named “nsync” and grant write access.

1. On the Nsync server, add a user for Nsync source (ex. nsyncsource1). For instructions on how to add a user on the N299, see **Chapter 4: System Management > User and Groups Management > Local User Configuration > Adding Users**.

2. On the Nsync server, grant that user (ex. nsyncsource1) write access to the **nsync** folder. For instructions on how to set up a folder’s ACL, see **Chapter 4: System Management > Folder Management > Folder Access Control List (ACL)**.

3. Once this is done, the target server will start accepting Nsync tasks from server using that ID and password.

### *Setting Up an Nsync Target on Another Device*

If you selected “Other Device” when setting up your Nsync task, the N299 will use the FTP protocol to back up the share folder. On the external storage device, make sure there is a folder named “nsync”, and the Auth ID has writable permission in that folder.

### *Designating N299 as an Nsync Target*

The N299 can act as an Nsync server, enabling another Nsync-equipped Thecus NAS at a remote location backup their files to this N299. From the **Network** menu, choose the ***Nsync Target*** item, and the **Nsync Target Server Setting** screen appears.

| Nsync Target Server Setting | |
|---|---|
| **Item** | **Description** |
| Nsync Target Server | ***Enable*** or ***Disable*** Nsync Target support. |
| Apply | Click ***Apply*** to save your changes. |
| Cancel | Click ***Cancel*** to cancel your changes. |

**NOTE** To enable Nsync task to go thru firewall, you have to open port TCP/1194 on your firewall in both directions.

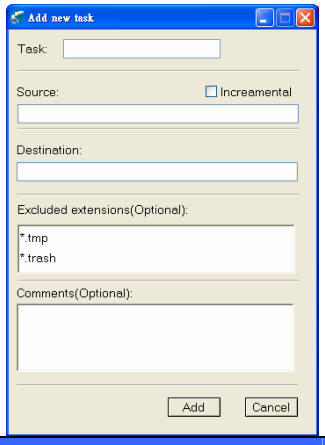
## Thecus Backup Utility

The Thecus Backup Utility is on your Installation CD. When you click on the CD, the Backup Utility will be installed under **Program Groups** > **Thecus** > **Thecus Backup Utility**. If it is not installed, you can copy the file (**Thecus Backup Utility.exe**) to a convenient location on your hard disk and double click to execute it.

**NOTE** *If you can not find Thecus Backup Utility on your CD, please download it from the Thecus website (http://www.thecus.com).*

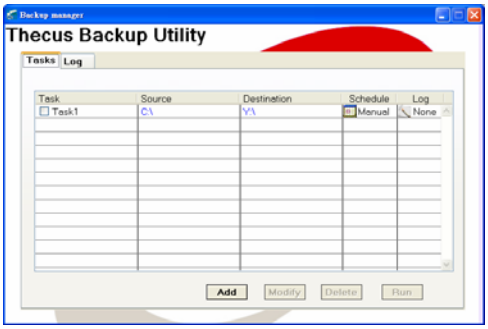
When you execute this utility for the first time, it will ask you whether to create a DB file. Click ***Yes***.

1. Click ***Add*** to create a Backup task. The **Add New Task** dialog box appears.




| Add New Task | |
|---|---|
| **Item** | **Description** |
| Task | Specifies a name for the current task. |
| Source | Click to specify the source folder/file location. |
| Incremental | Click to specify whether the backup will be incremental. If unchecked, the backup will be a full backup. |
| Destination | Click to specify the destination folder/file location. |
| Excluded extensions | Files with these file name extensions will be skipped and not back up to the destination. |
| Comments | If you wish, enter comments here for your records. |

2. To schedule the task to run at regular intervals, click on the ***Schedule*** icon for that task. You can schedule the task to run **Monthly** or **Weekly**.




3. To check the log for that task, click on the ***Log*** icon for that task.

**NOTE** *Thecus Backup Utility also supports MAC OS X. Just copy the Thecus Backup Utility.dmg to your MAC OS X machine and double click to execute it.*

## Windows XP Data Backup

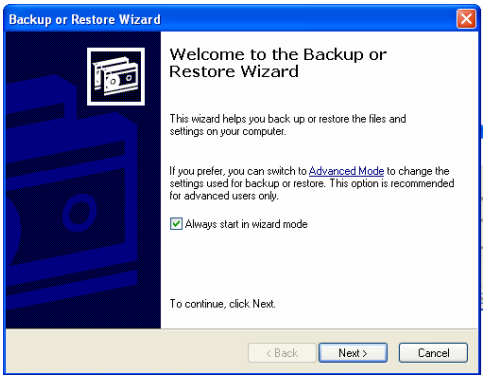
If you use Windows XP Professional, you can also use the Windows Backup Utility (Ntbackup.exe) to backup your files.

If you use Windows XP Home Edition, follow these steps to install the utility:

1. Insert the Windows XP CD into a drive and double-click the ***CD*** icon in **My Computer**.
2. When the Welcome to Microsoft Windows XP screen appears, click ***Perform Additional Tasks***.
3. Click ***Browse this CD***.
4. In Windows Explorer, navigate to ***ValueAdd*** > ***Msft*** > ***Ntbackup***.
5. Double-click ***Ntbackup.msi*** to install the backup utility.

Once installed, you can use the Windows Backup Utility by following the steps below:

1. Click ***Start***, and point to ***All Programs*** > ***Accessories*** > ***System Tools*** > ***Backup*** to start the wizard.


Backup or Restore Wizard
Welcome to the Backup or Restore Wizard
This wizard helps you back up or restore the files and settings on your computer.
If you prefer, you can switch to Advanced Mode to change the settings used for backup or restore. This option is recommended for advanced users only.
Always start in wizard mode
To continue, click Next.
< Back
Next >
Cancel

2. Click ***Next*** to skip past the opening page. Choose **Backup files and settings** from the second page, and then click ***Next***.
3. Select which option you Want to back up.

4. Click ***Next*** and in the Backup Type, Destination, and Name page, specify a back up location using the ***Browse*** button.

5. Find and select the drive that specifies your N299 as your backup destination and click ***Next***.

6. Click ***Next*** to display the wizard's final page and click ***Finish*** to start backing up.

### Apple OS X Backup Utilities

Mac OS X does not include any backup software. However, there are a number of backup solutions available for the Mac OS X, including: iBackup, Psyncx, iMSafe, Rsyncx, Folder Synchronizer X, Tri-BACKUP, Impression, Intego Personal Backup, SilverKeeper, and Apple's dotMac Backup utility to name just a few. To find even more freeware and shareware backup utilities to choose from, go to VersionTracker or MacUpdate and search on "backup".

## *One-Button USB Copy*

The N299 can quickly backup data from USB devices with its One-Button USB Copy function. To use this function, plug a USB storage device to the N299's front USB port. Then, simply press the One-Touch USB Copy button on the front panel, and all of the contents of the USB storage device will be copied over to the N299.

All of the files copied will be contained in the USBCopy service folder, under a subfolder names with a timestamp (YearMonthDayHHMM). For more on the N299's service folders, check out **Chapter 3: System Management** > **Storage Management** > **Service Folders**.

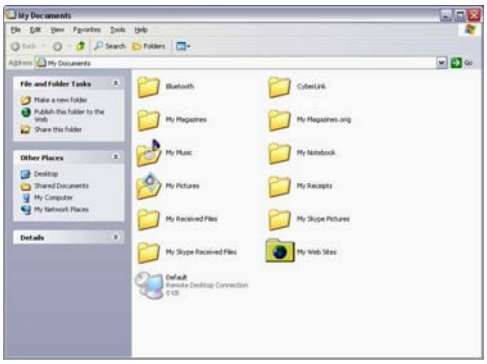
# Chapter 6: Tips and Tricks

## *Mapping a Client PC to the N299*

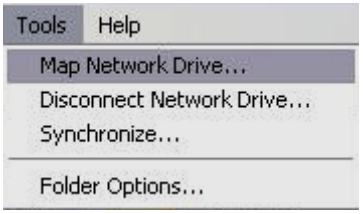
You can map share folders on the N299 so that you can access them as if they were drives on your computer. You can connect to the shared network folders on the N299 as follows:

### Windows

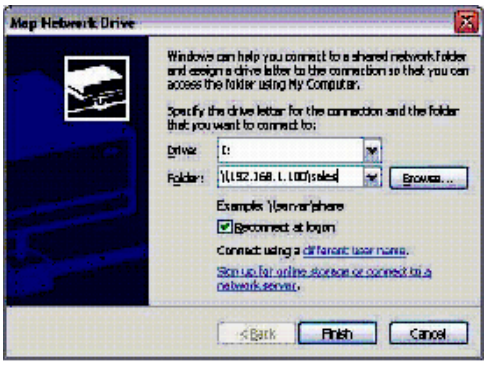
1. Go to the **My Computer** folder in Windows.



2. In the menu bar, select ***Tools*** and then ***Map Network Drive…***




3. The **Map Network Drive** window appears.


Map Network Drive
Windows can help you connect to a shared network folder and assign a drive letter to the connection so that you can access the folder using My Computer.
Specify the drive letter for the connection and the folder that you want to connect to:
Drive:
Folder:
Browse...
Example: \\server\share
Reconnect at logon
Connect using a different user name.
Sign up for online storage or connect to a network server.
< Back
Finish
Cancel

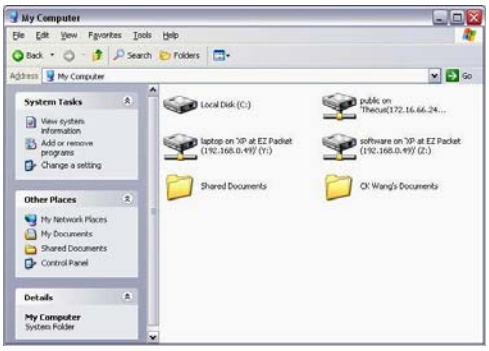
4. Assign a drive letter for the share folder.

5. Click the ***Browse*** button to find the folder over your network. Alternatively, you may enter the folder name you wish to connect to or enter its IP address. (i.e. `\\192.168.1.100\share`)

6. Click ***Finish***. When the **Connect As…** window appears, enter a user name and password.

Connect As...
By default, you will connect to the network folder as LAPTOP\CK Wang. To connect as another user, enter their user name and password below.
User name:
Password:
Browse...
OK
Cancel

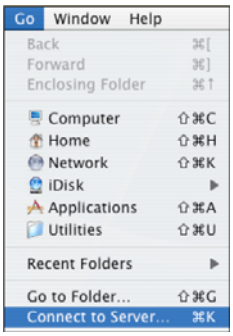
7. Click ***OK***. The share folder appears as the drive you assigned. You can now access this folder as though it were a drive on your computer.




## Apple OS X

On an Apple computer, you can connect to shared computers and servers using a network address.

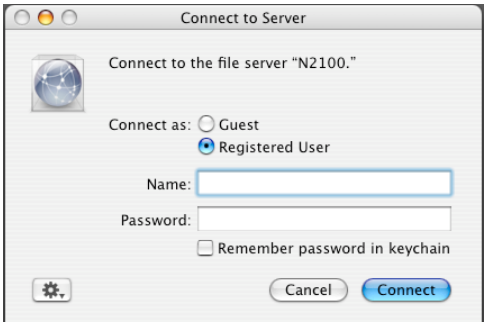
1. Choose ***Go*** > ***Connect to Server...***




2. Enter the network address for the server in the Server Address text box.

When connecting using SMB/CIFS protocol, type:
`smb://192.168.1.100/Folder1`
When connecting using AFP protocol, type:
`afp://192.168.1.100/Folder1`
Click ***Connect***.

3. When MAC OS X is trying to connect N299, it will ask for a User Name and Password which has access to the folder.




4. When MAC OS X has connected to the N299 successfully, an icon representing the folder will appear on the MAC OS X desktop. You can access the folder by double clicking on the icon.

## *USB Storage Expansion*

The N299 supports external USB hard disks through its two USB ports. Once a USB hard disk has been successfully mounted, users can access the files on the USB hard disk under the **USBHDD** folder. The N299 supports up to 6 USB external storage devices. All file names on the USB disk volume are case sensitive.

Before attaching a USB disk drive to N299, you have to partition and format it on a desktop computer or a notebook first. The attached device will be located at `\\192.168.1.100\usbhdd\usb1\1\` where `192.168.1.100` means the IP address of N299, usb1 stands for the first USB device, and `1` stands for the first partition on disk #1, the USB disk drive. If it is an NTFS partition, NAS users can open or copy files from `\\192.168.1.100\usbhdd\usb1\1` but cannot add new files or modify existing files.

**NOTE**

*If you want to write to an USB storage device, the file system must be FAT32.*

| *USB Storage* | *FAT32 Partition* | *NTFS Partition* |
|---|---|---|
| *Read* | *OK* | *OK* |
| *Write* | *OK* | *-* |

## *Replacing Damaged Hard Drives*

If you are using RAID 1, you can easily replace a damaged hard drive in the Thecus N299 while keeping your data secure with the system's automatic data recovery.

### Hard Drive Damage

When a hard drive is damaged, its LED glows a steady red. If there is data in the RAID volume, the system LED also glows red and the system beeps.

### Replacing a Hard Drive

To replace a hard disk drive in the N299:

1. Remove two screws located on the back of the unit using a Philips screwdriver.
2. Unscrew four mounting screws.
3. Lift up the hard disk tray by pulling up the top panel of the N299.
4. Remove the damaged hard drive.
5. Carefully insert a standard 3.5” SATA hard disk into the tray, and secure the hard disk with screws from the included accessory pack.
6. Carefully lower the hard disk tray back into the N299.
7. After making sure the tray is in place and the connectors are aligned, secure the hard disk tray with screws.

### RAID Auto-Rebuild

When using RAID 1 on the N299, you can use the auto-rebuild function when an error is detected.

1. When a hard disk fails the system beeps and/or an email notification is sent to specified receivers.
2. Check the hard disk LEDs to see which disk has failed.
3. Follow the steps mentioned above to replace the failed hard disk.
4. The system automatically recognizes the new hard disk and starts the auto-rebuild sequence to resume its status before the hard disk crash.

## *Remote Administration*

You can set up your N299 for remote administration. With remote administration, you can access your N299 over the Internet, even if your N299 is behind a router. This is especially useful if you are traveling and suddenly need a file from your N299.

Setting up remote administration is a three-part process, and will require the following equipment:

- Thecus N299 NAS device
- Cable/DSL Router with Dynamic DNS support
- Home PC
- Internet Connection

**NOTE** *Router setup will differ slightly depending on router used. For this example, we will use the Asus WL500g because it has support for Dynamic DNS. Contact your router hardware vendor for setup help.*

### Part I - Setup a DynDNS Account

1. Go to `http://www.dyndns.org` from your home PC.

2. Click on the ***Sign Up Now*** link.
3. Check the Check boxes, select a user name (i.e.: N299), enter your email address (i.e.: xxx@example.com), check ***Enable Wildcard***, and create a password (i.e.: xxxx).
4. Wait for an email from www.dyndns.org.
5. Open the email and click on the link to activate your account

### Part II - Enable DDNS on the Router

1. Go to the router setup screen and select ***IP Config*** > ***Miscellaneous DDNS Setting*** from your Home PC.
2. Click on ***Yes*** for **Enable the DDNS Client?**
3. Select **www.dyndns.org**.
4. Go to router setup screen, and enter the following information:
    a. User Name or E-mail Address: **xxx@example.com**
    b. Password or DDNS Key: **xxxx**
    c. Host Name: **www.N299.dyndns.org**
    d. Enable wildcard? Select ***Yes***
    e. Update Manually: Click ***Update***

### Part III - Setting up Virtual Servers (HTTPS)

1. Navigate to ***NAT Setting*** > ***Virtual Server***.
2. For **Enable Virtual Server?**, select ***Yes***
3. Setup the HTTPS Server
    a. **Well-Known Applications**: Select **User Defined**
    b. **Local IP**: Enter **192.168.1.100**
    c. **Port Range**: **443** (the default HTTPS port setting on the N299)
    d. **Protocol**: select **TCP**
    e. Click ***Add***.
    f. Click ***Apply***.
4. Test the HTTPS connection from another computer on the Internet
    a. From a remote computer, open your browser and enter **https://www.N299.dyndns.org**
    b. You should see the login page of N299.

## *Firewall Software Configuration*

If you are using a software firewall (i.e. Norton Internet Security) and are having trouble connecting to the N299, you can try the following steps:

1. Double click the **NIS** icon on system tray, and then configure the **Personal Firewall**.

2. On the **Programs** page, find the **SetupWizard.exe** and change its permission to "Permit All". If it's not in the program list, use the **Add** or **Program Scan** buttons to find it.

3. On the **Networking** page, manually add N299 IP address (i.e. 192.168.1.100) to the **Trusted** list.

# Chapter 7: Troubleshooting Guide

## *N299 Won't Turn On*

In the event that the N299 won't turn on, check to see that the power cable is correctly plugged in to the N299. Also check to see if the electrical outlet is functioning.

## *Resetting NAS IP Address and Admin Password*

If you've forgotten the admin password, or if you need to reset the unit's IP address, first make sure that the unit is powered off. With the unit powered off, press and hold the reset button. With the reset button held down, power on the system by pressing the power button. You will hear the unit beep once when you turn it on, do not release the reset button until you hear the unit beep again. After that, the N299's WAN IP address will be reset to 192.168.1.100 temporarily. Please note that all file services at this time will be stopped.

1. When you point your browser to 192.168.1.100, you will see the following screen.

2. If you select **Reset to Factory Default** option, the system will be reset. Below are the default system settings:
   Admin password → admin
   WAN IP address → 192.168.1.100
   WAN IP Gateway → 192.168.1.1
   WAN Jumbo Frame Support → Off
   LAN IP → 192.168.2.254
   LAN Jumbo Frame Support → Off
   HTTP Port → 80
   HTTPS port → 443

## *Forgot My Network IP Address*

If you forget your network IP address and have no physical access to the system, you can use the setup wizard to retrieve the IP of your N299.

1. Start the Setup Wizard, and it will automatically detect all Thecus IP storage products on your network.

2. You should be able to find the IP address of the N299 which you have forgotten in the **Device Discovery** screen.

## *Can't Access N299 from the LAN*

If you cannot access the N299 from the LAN, make sure that its network cable is correctly plugged in. Also, check to see if the N299's WAN and LAN settings are configured correctly.

## *Can't Map a Network Drive in Windows XP*

You may have problems mapping a network drive under the following conditions:

1. The network folder is currently mapped using a different user name and password. To connect using a different user name and password, first disconnect any existing mappings to this network share.

2. The mapped network drive could not be created because the following error has occurred: **Multiple connections to a server or shared resource by the same user, using more than one user name, are not allowed.** Disconnect all previous connections to the server or shared resource and try again.

To check out existing network connections, type `net use` under the DOS prompt.

## *N299 Chassis Feels Hot*

The N299 uses its chassis to dissipate heat, and feeling warm to the touch is completely normal. As such, make sure that the N299 is left in a well-ventilated area to avoid overheating the unit.

## *Can't Find Printer Server / Media Server / Download Manager*

To use these functions, you must first install their respective modules. Once installed, these will appear on the Main Menu. For installation instructions, refer to the sections below:

Chapter 4: Additional Feature Setup> ***Media Server Module Installation***

Chapter 4: Additional Feature Setup> ***Download Manager Module Installation***

Chapter 4: Additional Feature Setup> ***Printer Server Module Installation***

## *Restoring Factory Defaults*

From the **System** menu, choose the ***Factory Default*** item and **the Reset to Factory Default** screen appears. Press ***Apply*** to reset the N299 to factory default settings.

**WARNING** *Resetting to factory defaults will not erase the data stored in the hard disks, but WILL revert all the settings to the factory default values.*

## *Problems with Time and Date Settings*

The administrator is able to select an NTP Server to keep the N299's time synchronized. However, if the N299 can not access the Internet, you may encounter a problem when setting the Time and Time Zone. If this happens:

1. Login to the Web Administration Interface.
2. Navigate to ***System*** > ***Time***.
3. Under **NTP Server**, select ***No***.
4. Set the **Date**, **Time**, and **Time Zone**.
5. Click ***Apply***.

In addition, if the N299 is able to access the Internet and you want to keep the NTP Server `clock.isc.org` by default, please make sure the DNS Server is correctly, thereby allowing the NTP Server name to correctly resolve. (See ***Network*** > ***LAN 1*** > ***DNS Server***)

## *Simple Problem Diagnosis Procedure*

This procedure is meant to provide a simple and quick way to identify which part of the N299 has failed.

1. Don't insert a hard disk into the N299. Attach the power cord and then reset the IP address and admin password to the default settings by doing the following:
    a) Power on the N299 and immediately press the ***Reset*** button for 10 seconds. (The Reset button is near the LAN connector)
    b) This resets the N299 to its default IP address and password settings.
        - Default IP: `192.168.1.100`
        - Default admin password: `admin`

2. Attach the power cord and connect the LAN cable between the N299 and a PC. Don't use a hub.

3. Turn on the N299 and check the front panel. The **Power LED** should glow blue after power button is pressed. Then, the **Busy LED** starts blinking orange for around 60 seconds. After that, the **Busy LED** turns off. If the Busy LED keeps blinking orange for more than 3 minutes, the firmware may be corrupted during improper firmware upgrade procedures. It means that the motherboard has malfunctioned and needs to be repaired.

4. Set the IP address of the PC as `192.168.1.111`, and then access the **Login** page. Make sure the N299 and the PC is directly connected through a LAN cable, and not through a hub or a router.

5. Check if the Web Administration Interface shows up and works fine. Then, check if the system status is normal and the **HDD Power LED** works fine. If the results are positive, it means that the N299 is functioning normally. Otherwise, the N299 may be damaged.

6. Suppose that the N299 has been damaged. If the **Power LED** glows blue and both system and power fans work fine after power button pressed, the motherboard needs to be checked and repaired. Otherwise, the power supply unit has problems.

# Appendix A: Product Specifications

## *Hardware Specifications*

| | | |
|---|---|---|
| **Core Processors / Memory** | | |
| | Processor | StorLink SL3516 32-bit SoC |
| | SATA Controller | Integrated into Processor |
| | NOR Flash | 16MB |
| | Memory | 128MB |
| **Network Interfaces** | | |
| | WAN | 1 x 10/100/1000 Mbps Ethernet Port |
| | LAN | 1 x 10/100/1000 Mbps Ethernet Port |
| | Wireless (optional) | IEEE 802.11b/g AP mode (using approved USB Dongles) |
| **Storage** | | |
| | HDD Bays | 2 x 3.5" SATA HDD |
| | HDD Capacity | 80/120/160/200/250/300/400/500GB |
| | USB 2.0 | USB 2.0 ports for easy storage expansion |
| **IO Interfaces** | | |
| | USB | 2 x USB 2.0 port |
| **System Information** | | |
| | LED Indicators | 1 x Power LED<br>1 x System Busy LED<br>2 x Network LED<br>2 x HDD Activity LED |
| | Buzzer | System alert |
| **Physical** | | |
| | Width | 160 mm |
| | Height | 85 mm |
| | Depth | 200 mm |
| | Security | Kensington Lock |
| **Power Supply** | | |
| | External Adaptor | Switching power supply<br>Input: AC 100 ~ 240 Volt, 50/60 Hz<br>Output: DC 12V |
| **Environment** | | |
| | Temperature | 5 °C to 40 °C (Operating) |
| | Humidity | 0 ~ 80 % R.H. Non-condensing |
| | Safety and Environment | CE, FCC, BSMI, C-Tick, RoHS Compliant |

## *Software Specifications*

| | | |
|---|---|---|
| **Network** | | |
| | Configuration | Fixed IP address, dynamic IP address, PPPoE, DDNS |
| | Network File Protocols | Microsoft Networks (CIFS/SMB )<br>Apple Filing Protocol (AFP 3)<br>Network File System (NFS v3)<br>File Transfer Protocol (FTP)<br>WebDisk (HTTP/HTTPS) |
| | Client Platform Support | Windows NT / 2000 / XP / 2003 / Vista<br>UNIX / Linux / BSD<br>Apple OS X / 9 / 8.6 |
| | DHCP Server | Assigning IP addresses on WAN / LAN / WLAN ports |
| | Print Server | Network printing through Internet Printing Protocol (IPP) |
| | Download Manager | Supports BT, FTP, HTTP scheduled downloads |
| **Disk Management** | | |
| | RAID Levels | 0, 1, JBOD |
| | Auto Rebuild | Rebuild new hard drives while inserting to an existing RAID system |
| **Power Management** | | |

| | | |
|---|---|---|
| | Fan | Thermally-controlled system fan |
| **Multimedia Support** | | |
| | Media Server | Supports uPnP AV streaming protocol |
| | iTunes Server | Supported File Types: AAC, MP3, WAV |
| | Photo Web Server | Supported File Types: GIF, JPG (JPEG), BMP, PNG<br>Supports EXIF display<br>Supports slide show |
| | Simple Surveillance Server | Supports image capture, scheduling |
| **Share Management** | | |
| | User Authentication | Supports built-in user accounts and groups |
| | Folder Management | Share Folder Level Permission<br>Public Folder |
| | Permission Management | Read/Write, Read Only or Deny options on individual users or groups |
| **File System** | | |
| | File System Type | Journaling File System |
| | Language Support | Multilingual support |
| **System Management** | | |
| | Web-based Administration | Multilingual support<br>English, French, German, Italian, Spanish, Traditional Chinese, Simplified Chinese, Korean, and Japanese |
| | Setup Wizard | MS Windows discovery and setup utility program |
| | Email Notification | Send system message via Email to specified Email accounts |
| **Backup** | | |
| | Thecus Backup Program | Thecus Backup Utility (Client backup utility; supports Microsoft Windows XP/2000/MAC OS X) |

** For supported USB dongles, please contact sales@thecus.com

# Appendix B: Customer Support

If your N299 is not working properly, we encourage you to check out **Chapter 7: Troubleshooting Guide**, located in this manual. You can also try to ensure that you are using the latest firmware version for your N299. Thecus is committed to providing free firmware upgrades to our customers. Our newest firmware is available on our Download Center:

http://www.thecus.com/download.php

If you are still experiencing problems with your N299, or require a Return Merchandise Authorization (RMA), feel free to contact technical support via our Technical Support Website:

http://www.thecus.com/support_tech.php

Customers in the US should send all technical support enquiries to this email address:

support-us@thecus.com

If you would rather receive support over the phone, you can contact Thecus FAE Support at:

+886-2-26981788

Please note that our headquarters are in Taipei, Taiwan, and our office hours are Monday to Friday, 9:00 to 17:00.

For Sales Information you can e-mail us at:

sales@thecus.com

# Thank you for choosing Thecus!

# Appendix C: RAID Basics

## *Overview*

A Redundant Array of Independent Disks (RAID) is an array of several hard disks that provide data security and high performance. A RAID system accesses several hard disks simultaneously, which improves I/O performance over a single hard disk. Data security is enhanced by a RAID, since data loss due to a hard disk failure is minimized by regenerating redundant data from the other RAID hard disks.

## *Benefits*

RAID improves I/O performance, and increases data security through fault tolerance and redundant data storage.

### Improved Performance

RAID provides access to several hard disk drives simultaneously, which greatly increases I/O performance.

### Data Security

Hard disk drive failure unfortunately is a common occurrence. A RAID helps prevent against the loss of data due to hard disk failure. A RAID offers additional hard disk drives that can avert data loss from a hard disk drive failure. If a hard drive fails, the RAID volume can regenerate data from the data and parity stored on its other hard disk drives.

## *RAID Levels*

The Thecus N299 supports standard RAID levels 0, 1, and JBOD. You choose a RAID level when you create a system volume. The factors for selecting a RAID level are:

- Your requirements for performance
- Your need for data security
- Number of hard disk drives in the system, capacity of hard disk drives in the system

The following is a description of each RAID level:

### RAID 0

RAID 0 is best suited for applications that need high bandwidth but do not require a high level of data security. The RAID 0 level provides the best performance of all the RAID levels, but it does not provide data redundancy.

RAID 0 uses disk striping and breaking up data into blocks to write across all hard drives in the volume. The system can then use multiple hard drives for faster read and write. The stripe size parameter that was set when the RAID was created determines the size of each block. No parity calculations complicate the write operation.

### RAID 1

RAID 1 mirrors all data from one hard disk drive to a second one hard disk drive, thus providing complete data redundancy. However, the cost of data storage capacity is doubled.

This is excellent for complete data security.

### JBOD

Although a concatenation of disks (also called JBOD, or "Just a Bunch of Disks") is not one of the numbered RAID levels, it is a popular method for combining multiple physical disk drives into a single virtual one. As the name implies, disks are merely concatenated together, end to beginning, so they appear to be a single large disk.

As the data on JBOD is not protected, one drive failure could result total data loss.

## *Stripe Size*

The length of the data segments being written across multiple hard disks. Data is written in stripes across the multiple hard disks of a RAID. Since multiple disks are accessed at the same time, disk striping enhances performance. The stripes can vary in size.

## *Disk Usage*

When all 4 disks are of the same size, and used in RAID, the N299's disk usage percentage is listed below:

| RAID Level | Percentage Used |
|---|---|
| RAID 0 | 100% |
| RAID 1 | 50% |
| JBOD | 100% |

# Appendix D: Licensing Information

## *Overview*

This product included copyrighted third-party software licensed under the terms of GNU General Public License. Please see THE GNU General Public License for extra terms and conditions of this license.

## *Source Code Availability*

Thecus Technology Corp. has exposed the full source code of the GPL licensed software. For more information on how you can obtain our source code, please visit our web site, http://www.thecus.com.

### Copyrights

- This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).
- This product includes software developed by Mark Murray.
- This product includes software developed by Eric Young (eay@cryptsoft.com).
- This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).
- This product includes PHP, freely available from (http://www.php.net/).
- This product includes software developed by the University of California, Berkeley and its contributors.
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